

WAR DEPARTMENT
OFFICE OF THE ADJUTANT GENERAL

PROVISIONAL
Drill and Service Regulations
for Field Artillery
(Horse and Light)

1916



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The following provisional system of Drill and Service Regulations for Field Artillery (Horse and Light), 1916, is approved and herewith published for the information and government of the Army of the United States.

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PART X.

ARTILLERY IN THE FIELD.

CHAPTER I.—EMPLOYMENT OF FIELD ARTILLERY.

SECTION I.—CHARACTERISTICS OF THE ARM.

1464. The characteristics of Field Artillery are:

1. Great power concentrated in a relatively small tactical unit.
2. Rapidity of fire.
3. Long range.
4. Ability to act from concealed positions.

The first characteristic facilitates intelligent direction. It enables a commander to hold a powerful force well in hand and to bring it to bear with the desired intensity at the proper place and time.

The second characteristic enables Artillery to bring a crushing fire to bear upon a vulnerable enemy before he can escape from its action.

The third characteristic permits Artillery great freedom of action, enabling it to interpose effectively over a broad terrain and to secure the concentration of effort of widely dispersed units.

The fourth characteristic facilitates establishing the guns in favorable positions, acting by surprise, preserving freedom of maneuver, and makes it possible for inferior Artillery to remain on the battle field.

Field Artillery, on the other hand, has certain limitations which prevent its employment as an independent, self-sustaining arm. Among these may be mentioned:

(a) It is unable to act otherwise than by fire.

(b) It is extremely vulnerable when exposed in the open to percussion fire at medium ranges; also if exposed to shrapnel fire when in route formation or when in the act of occupying a position, as it can protect itself only with difficulty by fire action, concealment, or escape.

(c) Even when unlimbered it defends itself with difficulty against attacks on its flanks or rear.

The tactics of Field Artillery are based upon its characteristic properties and limitations and upon its employment as an auxiliary to the other arms in battle.

SECTION II.—PRINCIPLES.

1465. The exact method of employing Field Artillery depends, as for the other arms, upon the particular tactical situation and upon the plan decided upon by the commander of the troops. The commander of the troops, the Artillery commander, and regimental and battalion commanders must clearly indicate to their respective subordinates the objects to be accomplished. Technical details should, as far as possible, be left to subordinates, so that superior commanders may be free to follow the developments of the action and to apply the means at their disposal most advantageously in meeting the various conditions. The ends to be attained and the methods of attaining those ends vary with the nature of the action, as well as with each particular phase thereof.

The principles set forth in these regulations are the general guides of action. By study and reflection these principles are

assimilated; by practice in applying them to real or assumed conditions the habit of prompt and correct action is acquired. To the professional readiness thus obtained must be added loyalty in carrying out the plans of a superior, skill in recognizing and seizing opportunities, and determination to win at any cost.

1466. Cooperation.—Artillery has in general no independent rôle on the battle field. Its sole object is to assist the other arms.

To secure decisive results, troops must advance, occupy the hostile position and by vigorous pursuit destroy or throw into confusion the hostile forces. The isolated and independent action of Artillery leads to no decisive results. Close cooperation between the Artillery and the troops which it supports is, then, necessary for effective action. To insure this there must not only be a mutual understanding of each other's methods of action, powers, and limitations, and sure and rapid means of communication between the various elements concerned, but there should be a preliminary conference between the Infantry and Artillery commanders concerned as to the definite plans of each, their expected development and the actual means of communication to be employed.

Infantry which is engaged must be accompanied by Artillery officers and scouts, who will communicate to the Artillery commander changes in the situation and the needs of the Infantry. Artillery assists the forward movement of the other arms by keeping down the hostile fire directed upon its own troops. This end is best accomplished through the infliction of physical losses upon the important parts of the hostile forces.

In the case of two opposing forces neither of which is able for the time being definitely to assume the offensive, the power-

ful and continued action of the Artillery may be necessary to determine upon and to prepare the way for the forward movement of the troops.

1467. Unity of direction.—Whenever Artillery is used, a decisive effect is usually intended. Its influence is powerful in proportion to the timeliness with which it is brought to bear. The characteristic properties of Artillery permit its fire to be readily shifted from place to place and to be concentrated or distributed as circumstances require. Effect is ordinarily secured by concentration upon targets which are at the moment the important ones. To insure the utilization of the properties of Artillery and their adaptation to the requirements of an action, unity of direction is essential. If the Artillery is to be effectively employed in aiding the other arms, it is absolutely necessary that the Artillery commander be informed and be kept informed of the plans and intentions of the superior commander and of the tactical situation. In order that this information may be available at the proper time, it is essential that the Artillery commander accompany the commander of the troops during the march into action and the preliminary reconnaissance.

A division is the smallest body of troops having Artillery permanently assigned to it. The division commander controls his Artillery through his senior Artillery commander, giving him general instructions as to positions to be occupied and tasks to be performed, and holding him responsible for results secured.

To insure the cooperation of the Field Artillery with the other arms it is the duty of the senior Artillery commander to submit to the commander of the troops in ample time for appropriate action, recommendations concerning the position and use of the Field Artillery of the command.

An officer charged with the accomplishment of a special mission, or one commanding an important sector of a battle field, should, in general, have command of the Artillery designated to cooperate in the tasks assigned him. When it is necessary to detach bodies of Artillery from their regular organizations for this purpose, it should be done by order of the superior commander only, who will make it clear to all concerned with whom the command of the detached Artillery lies. When once detached, they are not returned to their proper organizations without similar authority. In emergencies, however, Artillery finding itself in a given sector without definite instructions should at once report itself to the commander of that sector.

Unity of direction is favored by keeping the batteries, especially within the battalion, fairly close together. A well-organized communication service is essential to coordinate direction. It is the rule to use Field Artillery in regiments or battalions. The employment of batteries singly is the exception, while the employment of smaller subdivisions is warranted only under the most exceptional circumstances.

While unity of direction, as a general principle, governs in the employment of Field Artillery, this does not remove or lessen the obligation imposed upon all officers to meet the sudden and unexpected emergencies of an action, when time does not admit of reference to the next higher authority.

1468. Utilization of forces.—The number of batteries actually brought into action must be sufficient to dominate the situation from the outset and to assure the prompt and effective accomplishment of the specific task assigned to the Artillery. To secure decisive results, superiority of fire is, in general, necessary; but it is important, especially during the earlier stages of an engagement, that the number or the positions of the guns should not be prematurely betrayed nor ammunition be

uselessly expended by the employment of a greater number of guns than the actual situation requires. Moreover, it is essential that the superior commander should always have at his disposal batteries that can be utilized to meet the recurring emergencies of battle.

It is, therefore, a principle that all guns should be placed in position at an early stage of the action, but only so many of them should be employed at any one time as are actually necessary. It is not, as a rule, desirable to detail Field Artillery to form part of a general reserve. The true reserve of Field Artillery is its ammunition train.

1469. Preparatory dispositions.—Premature commitment of Artillery to action is to be avoided. On the other hand, Artillery must be available and ready for every duty as it arises.

Readiness for action is secured and freedom of maneuver retained by posting Artillery in or near suitable concealed positions, and making all preparations for meeting the probable phases of the action.

To facilitate the work of preparation, the duties assigned to Artillery in observation or readiness are made as definite as the conditions will permit. Thus, the terrain in which the enemy is expected to appear may be divided up into sectors and each sector may be assigned to a given unit. Moreover, both in the preparatory and the later phases of an action special duties may be assigned to particular batteries.

For example:

1. To fire upon the hostile Artillery. Such batteries are called **counter batteries**. This designation may be made previously to opening the engagement, in order that the hostile Artillery may be discovered and fired on before it can seriously enter the engagement, or it may be made after a portion of the hostile Artillery has become effective and it is necessary to

overpower it and keep it under subjection. The term, then, is distinctive of those batteries whose special function it is to combat the enemy's Artillery.

2. To prepare and support the Infantry attack. These batteries are called **Infantry batteries** and include those assigned to the direct support of our Infantry, assisting it by firing on the hostile Infantry, by opening breaches in the enemy's lines or by otherwise facilitating the advance. The Infantry batteries are under the protection of the counter batteries, and include the so-called batteries of preparation, which fire on the opposing Infantry, and the breaching batteries, whose mission is to open by their fire passages in the enemy's line through which our troops may advance.

3. To be prepared to meet a counter attack. Such batteries are called **batteries of the counter attack**. Batteries of the counter attack are posted in observation, or readiness, carefully watch the terrain, and assist in defeating any counter attack the enemy may make.

4. To advance to the close support of the Infantry attack. These batteries are called **accompanying batteries**. The term accompanying batteries must not be too narrowly interpreted as meaning an actual presence of the accompanying batteries on the Infantry firing line, for in reality these batteries accompany with fire rather than by actual movements of the guns. Batteries may, however, be actually moved forward when by such forward movement a distinct and positive advantage will be obtained or the morale of the Infantry be materially increased.

5. To come to the assistance of other batteries. Batteries designated for this duty are called **reenforcing batteries**; such batteries may have been previously held in observation or readiness, may have just arrived on the field or been called in from an adjacent sector.

6. To draw the fire of the enemy's Artillery which has not disclosed itself. Such a battery is called a decoy battery. It is usually placed in an advanced position with wide intervals, and acts with great rapidity of fire so as to lead the enemy to believe he is opposed by a much larger force, thus inducing him to disclose his position.

The above examples must not be construed as authorizing a rigid, unchanging division of duties. Individual batteries may be called upon to perform, during the course of an engagement, all of the functions indicated.

The superior Field Artillery commanders must follow closely the developments of the action and make such modifications in the duties to be performed and the sectors to be covered as will make it possible quickly to concentrate the maximum obtainable fire upon the targets which at any particular time are most dangerous to our Infantry.

1470. Employment of fire.—The power of Artillery should not be frittered away in desultory bombardments nor upon unimportant targets. Its employment is to be adapted to the phases of an action, so that it may exert the strongest influence upon the important objectives and at the critical moments.

The opportunities of striking an enemy while he is vulnerable are ordinarily intermittent and brief. They occur, for example, when the enemy moves from cover to cover, or when he exposes himself in order to contend effectively against our own troops.

Suddenness of action is thus often a necessity. If the action is also by surprise, effect, especially the moral effect, is increased.

The outbursts of rapid fire called for will therefore be intermittent, depending upon the nature and phase of the combat.

A prolonged deliberate fire, however, may be requisite for destroying material objects; for holding a sheltered enemy under

subjection, preventing his supply and reenforcement, and precluding his effective interposition in the engagement; for searching for an enemy's reserves, etc.

Opportunities for using flanking and oblique fire must be sought.

These methods of action are made possible and effective by timely reconnaissance, by skillful selection and occupation of positions, by careful preparation, and an efficient conduct of fire, and by thorough cooperation between the Artillery and the troops it is ordered to support.

1471. Economy of ammunition.—It is made the duty of every Field Artillery commander to exercise constant and unremitting care to economize ammunition. Ammunition is to be economized by carrying the adjustment to the degree of certainty permitted by the conditions and especially by not firing on small and unimportant targets. Fire when once opened must be sufficient to produce the result required but all officers must, by careful supervision and observation, aid in preventing extravagant expenditures.

SECTION III.—ASSIGNMENT TO DETACHED ORGANIZATIONS.

1472. For suitable assignment of Field Artillery to protective and reconnaissance bodies, such as advance and rear guards and outposts, subdivision of units must frequently be recommended by the senior Artillery officer but decided upon and ordered by the commander of the troops.

In making such assignments complete organizations should be taken, as a battery, a battalion, or a regiment.

1473. The composition and strength of an advance guard is dependent upon the size of the command it is to cover, its special duties and the tactical situation,

Whether or not it should contain Artillery is a matter of estimation and decision in each particular case.

In general, a division is the smallest unit employing Field Artillery in its advance guard. If combat is imminent or strong resistance is expected a battalion is usually the proper unit for an advance guard consisting of two regiments or a brigade of Infantry. A regiment of Artillery will unduly separate the Infantry elements of the advance guard and interfere with unity of direction, and its presence may cause the advance guard to engage in a combat not contemplated by the division commander.

There may be special cases when such a large assignment is proper, as, for example, an advance to a specially prepared or reconnoitered position, or an advance behind an efficient Cavalry screen, but care should be taken not to overburden an advance guard with an unnecessary amount of Field Artillery.

A single battery is generally not enough if serious resistance is expected, but there may be cases where one is sufficient for the advance guard of a division, as where the resistance takes the form of annoyances and delays by small hostile bodies.

A single battery may be assigned to the advance guard of a reenforced brigade under special conditions. In smaller detachments than this, road spaces and distances are so small that nothing is gained by marching any Field Artillery in the advance guard, while security requires that it march with the main body.

1474. In a pursuit Field Artillery, owing to its long range, should be liberally supplied to the advance elements of all of the pursuing bodies. In such cases its most effective use will be against the flanks of the retreating columns. With Cavalry escorts Field Artillery units can occupy positions for this, but due regard must be paid to the enemy's ability to make sudden offensive returns.

1475. Field Artillery should not ordinarily be assigned to mere train guards or rear troops intended for protection against hostile mounted troops.

A fighting rear guard protecting the retreat of the main body should have Field Artillery.

A rear guard covering the retreat of a defeated force should have assigned to it practically all of the guns of the command or they should be so marched that they are available for its prompt reenforcement, as they are a powerful auxiliary in forcing a deployment or otherwise delaying pursuing troops.

1476. A battery is usually sufficient Artillery for a flank guard not larger than a regiment of Infantry, and a battalion for a flank guard consisting of two regiments or an Infantry brigade.

In nearly all cases a command having out a flank guard has also an advance or a rear guard, and care must be exercised that unity of direction is not sacrificed by dividing the Field Artillery too much among the three bodies.

1477. Field Artillery is not ordinarily assigned to outposts for night duty when the command is making daily marches. The necessity for such use is exceptional, and as the animals must remain harnessed if not actually hitched all night the duty is very fatiguing.

If a daybreak attack on the outposts is anticipated, positions for the Artillery units should be reconnoitered and the routes thereto marked. Dawn should then find the Artillery ready to support the outpost.

Artillery is particularly useful to outposts when its fire can cover defiles or sweep large open spaces and when it commands positions that may be occupied by hostile Artillery.

1478. When any Field Artillery unit is assigned to an advance, rear, or flank guard, the unit continues to be a part

of such command until specifically relieved or until march conditions are ordered terminated.

1479. Field Artillery ordered to support certain units of the command remains under the orders of the senior Artillery commander.

1480. In defensive positions, Field Artillery units are usually assigned by the general commander to sections of the line of defense and placed under the actual command of the officers commanding the sections.

1481. Horse Artillery only should ordinarily be assigned to Cavalry commands. But if Horse Artillery be lacking, there should be no hesitation in attaching Light Artillery units to Cavalry in special situations, such as a pursuit, or a Cavalry detachment covering the retreat of a defeated force.

1482. Field Artillery assigned to advance or flank guards should ordinarily be so assigned intact—that is, with its combat trains. In the case of rear guards, outposts, and special Cavalry commands, the particular conditions will frequently warrant sending only the firing batteries.

SECTION IV.—LEADERSHIP.

1483. The art of leadership of Field Artillery troops consists in the application of sound tactical and technical principles to concrete cases in service.

1484. These regulations enunciate certain tactical and technical principles for the handling of Field Artillery in the field. These principles are the result of experience, test, and careful consideration of fundamentals. Experience has proven that a violation of these accepted principles generally leads to inefficiency. The principles should therefore never be violated. To carry out these principles certain rules and regulations of varying rigidity are prescribed. These rules are guides, but

they may be construed liberally or even disregarded provided the principle involved is not violated.

For example: It is prescribed that the lines of communication between all of the elements of a Field Artillery command shall be established from the senior to the junior, or from the top downward. The principle here involved is that all of the elements of a command must be in communication with the next higher element. The rule for the establishment of this communication is that the senior connects with the junior. In exceptional cases, a battery commander may be ordered to establish or of his own volition may establish communication with his battalion commander. Here is a decided departure from the rule, but the integrity of the principle of communication is maintained.

1485. An assimilation of these fundamental principles and of the rules for their application, an accurate and detailed knowledge of the matériel and its powers and limitations, coupled with self-reliance, initiative, and a conception of teamwork are the fundamental characteristics of successful leadership of Field Artillery.

1486. A correct grasp of the situation is essential to reach a decision and to formulate a definite plan of action. The time element which enters every problem in the field will never permit delay of the decision until everything is known. The time allowable for decision decreases with the size of the command. Battery commanders, especially, must frequently make immediate decisions on very little information, and in the conduct of fire their decisions must frequently be instantaneous. The ideal decision and plan can never be attained. Intelligence, unflagging zeal, and the constant solution of problems of varying natures enable a leader to approximate the ideal solution.

1487. The prompt transmission of a clear understanding of the plan to those subordinates charged with its execution is secondary in importance only to the plan itself. This is an essential part of leadership. Experience has shown that it is most difficult of attainment and therefore requires special study and constant practice.

1488. A good plan once adopted and its execution inaugurated should not be abandoned for any other plan, whatever its promise, unless it becomes clear that the original plan can not succeed. It is more difficult to arrest or change a plan once begun than it is to initiate one. Afterthoughts are dangerous except as they aid in the execution of the original plan.

1489. Complicated plans are not likely to succeed in war. All plans and the methods adopted for carrying them into effect must be simple and direct.

1490. Order and cohesion within the units and communication with the units must be maintained if success is to be expected.

1491. Commanders must show themselves to be true leaders. They must act in accordance with the spirit of their orders. Self-interest must be eliminated from their calculations.

1492. The best results are obtained when leaders know the capacity and traits of those whom they command; hence tasks should be assigned with due regard to the capacity of individuals, and in making detachments units should not be broken up nor a disposition ordered that will cause an intermingling of units.

1493. The authority of commanders should be exercised with firmness, kindness, and justice. Discipline should be strict but not tyrannical. Punishments must conform to law and follow offenses as promptly as the circumstances will permit. Tyrannical or capricious conduct and the use of abusive language is not only forbidden but weakens the authority of a

commander. Courtesy to subordinates is as indispensable as courtesy to superiors.

1494. Commanders should exhaust every effort to keep their commands properly equipped. In order to lighten the severe physical strain inseparable from service in campaign, efforts must be made to spare the troops and animals unnecessary hardship and fatigue; but when necessity arises the limit of endurance must be exacted.

1495. The latitude allowed to subordinate commanders is in direct proportion to the size of their commands. Each leader should see to the execution of his task, leaving to the proper subordinates the execution of details and interfering only when mistakes are made that threaten seriously to prejudice the general plan. Where the troops of different units come in contact with each other, the leader must indicate a dividing line or one task must be subordinated to another by a definite order.

1496. This method of leadership requires that subordinates be not only acquainted with the decision and plan of the commander and the particular task assigned, but, in order to induce self-reliant action on his part, the subordinate must from the beginning be kept informed as to so much of the situation as may have a bearing upon his actions.

Statements intended to justify a course of action are evidence of weakness and mental indecision. Garrulousness, verbosity, argument, and discussion with subordinates weaken authority and should be avoided.

1497. True leadership will not knowingly employ ambiguous terms in the expression of orders or wishes. The desirable must be clearly expressed and whether or not it is to be attained by all means. A firm resolution must be always apparent in written or verbal orders and in the demeanor of the leader.

1498. Command in war demands the utmost tact, wise self-restraint, and rigorous clearness. The problem of command is not only to move troops and place them for action; its task is the wider one of causing self-reliant action on the part of all the subordinate leaders, of directing the spiritual forces of the command in the right direction and of concentrating the combined physical, mental, and moral energies of the command upon the attainment of the end indicated by the superior commander, which must be clearly and unmistakably communicated to all concerned.

SECTION V.—TEAMWORK.

1499. The greater part of any Field Artillery command goes into action and remains under the immediate control of responsible officers. However, in reconnaissance work, in the ammunition-supply service, and even in the batteries when communications fail or emergencies suddenly occur subordinates will be thrown upon their own responsibilities.

Subordinates must therefore be given great latitude in the execution of their tasks. The success of the whole depends largely upon how well each subordinate coordinates his work with the general plan.

1500. In a given situation it is far better to do any intelligent thing consistent with the forceful execution of the general plan, than to search hesitatingly for the ideal. This is the true rule of conduct for subordinates who are required to act upon their own initiative.

A subordinate who is reasonably sure that his intended action is such as would be ordered by the commander, were the latter present and in possession of the facts, has enough encouragement to go ahead confidently. He must possess the loyalty to

carry out the plans of his superior and the keenness to recognize and to seize opportunities to further the general plan.

1501. Initiative must not become license. Regardless of the number of subordinates who are apparently supreme in their own restricted spheres, there is but one battle and but one supreme will to which all must conform.

Every subordinate must therefore work for the general result. He does all in his power to insure cooperation between the subdivisions under his command. He transmits important information to adjoining units or to superiors, and, with the assistance of information received, keeps himself and his subordinates duly posted as to the situation.

1502. When circumstances render it impracticable to consult the authority issuing an order, officers should not hesitate to vary from such order when it is clearly based upon an incorrect view of the situation, is impossible of execution, or has been rendered impracticable on account of changes which have occurred since its promulgation. In the application of this rule the responsibility for mistakes rests upon the subordinate, but unwillingness to assume responsibility on proper occasions is indicative of weakness.

Superiors should be careful not to censure an apparent disobedience where the act was done in the proper spirit and to advance the general plan.

1503. All officers and noncommissioned officers seize every opportunity to exercise the functions consistent with their grade, and all assist in the maintenance of order and control.

Every lull in the action should be utilized for as complete restoration of order as the conditions permit, for the resupply of ammunition, for overhauling communications, and for providing concealment and cover.

1504. Any officer or noncommissioned officer who becomes separated from his proper unit and can not rejoin must at once place himself and his command at the disposal of the nearest higher commander.

Anyone having completed an assigned task must seek to rejoin his proper command. Failing in this, he should join the nearest Artillery engaged with the enemy.

Soldiers are taught the necessity of remaining with their batteries, but those who become detached must join the nearest command and serve with it until the battle is over or reorganization is ordered.

SECTION VI.—FIELD ORDERS.

General Considerations.

1505. The object of field orders is to bring about a course of action in accordance with the intention of the leader, suited to the occasion, by insuring the cooperation of the various elements of the command in the execution of a mission.

This involves a preliminary consideration of all the circumstances which necessitate a course of action, commonly called the **estimate of the situation**, a logical conclusion based upon such estimate, commonly called the **decision**, a **plan of action** to carry out the decision, and a statement, written or oral, of the decision and plan, which statement constitutes the **order**.

Whenever possible the formation of the plan is preceded by a personal reconnaissance of the terrain.

1506. In service, the time available for estimation of the situation, formation of a plan, formulation of the order and its transmission to subordinates will vary greatly from hours to minutes and even to seconds. By constant practice with all manner of technical and tactical problems under varying con-

ditions, officers must habituate themselves to a rapid process of accurate reasoning, to the quick enunciation of clear and comprehensive orders and commands, and to resolute action.

Composition of the Order.

1507. A decision having been reached and a plan of action decided, the first step is a consideration of how much of the information upon which this decision and plan are based should be given out, and how much is necessary for that understanding by subordinates which insures their intelligent cooperation. In emergencies this part of the order may have to be omitted, due to the necessity for prompt action, but when time permits it should habitually be done, and, when it must be omitted, the first opportunity to inform the command should be seized. If no change in the situation has occurred it is best so to state. If there has been a material change in the situation and no orders are necessary, it is still well to communicate this information at seasonable moments and thus to keep the command constantly advised. Care must be exercised in publishing distressing or discouraging news likely to impair the morale of the command.

The second part of the order in logical sequence is the statement of the plan of the commander. As a rule this should be brief. By itself, it would ordinarily convey little definite information to a subordinate as to his own course of action. It should, however, be unmistakable and unequivocal and express fully the decision of the commander.

The third part of the order contains the disposition decided upon to carry out the decision expressed in the second part. It should therefore be the logical outgrowth of the preceding part and is in reality a continuation or supplement to that part.

It is generally not sufficient to tell each subordinate his own part of the program only. Successful cooperation and self-reliance require that each subordinate be acquainted with the tasks assigned to the others. This part usually contains orders to the next lower tactical units only.

The fourth part of the order contains such instructions as do not strictly pertain to the preceding part and instructions to parts of the command not involved directly in the tactical or technical part of the plan, such as trains, sanitary units, etc.

The fifth part of the order gives the location of the commander or of headquarters, or the point to which messages and reports are to be sent. It also informs as to the location of lines of information, if any have been established.

1508. Field orders to a command of any size logically fall into the five parts above mentioned or become what may be called the **five-paragraph order**. It is a logical model to follow in both written and verbal orders, as its form is such as to secure and insure consideration of all essential tactical details both on the part of the one issuing the order and on the part of the recipients.

Every leader must follow a logical system for formulating orders, practice it until it becomes second nature, and then habitually follow his accepted system. In this way only can he be reasonably certain that his orders cover all that is required.

1509. Clear and concise instructions are given as to the action to be taken in the combat by each part of the command. In this way the commander assigns tasks, fronts, objectives, sectors, or areas, etc., in accordance with his plan. If the terms employed convey definite ideas and leave no loopholes the conduct of subordinates will generally be correspondingly satisfactory.

1510. When issuing orders, a commander should indicate clearly what is to be done by each subordinate, but not how it is to be done. He should not encroach upon the functions of a subordinate by prescribing details of execution unless he has good reason to doubt the ability or judgment of the subordinate, and can not substitute another.

Although general in its terms, an order must be definite and must be the expression of a fixed decision. Ambiguity or vagueness indicates either vacillation or the inability to formulate orders.

1511. Usually the orders of a commander are intended for, and are given to, the commanders of the next lower units, but in an emergency a commander should not hesitate to give orders directly to any subordinate. In such case he should promptly inform the immediate commander concerned.

1512. Combat orders should prescribe communication, reconnaissance, flank protection, etc., when some special disposition is desired or when an omission on the part of a subordinate may reasonably be feared.

1513. Arguments, reasons, conjectures, or any part of the mental process entering into the estimate have no place in a field order. Facts, or what are supposed to be facts, and definite instructions only, should be incorporated.

Administrative details should be covered in separate orders except when circumstances require that they be included in the field order.

1514. Orders issued by subordinates should not be mere repetitions of those from higher authority with additions of their own. New orders are generally clearer and more satisfactory, though in giving verbal orders it is frequently desirable to read any written orders from superior authority.

1515. The initial combat orders of the Field Artillery brigade are usually written. The written order is preferable and is used whenever time permits. If time permits, subsequent orders are likewise written, either as field orders or as messages.

Written orders should be so distinct as to be legible even in a bad light. Sentences should be short. Geographical names are spelled in ROMAN CAPITALS. Where the spelling does not conform to the pronunciation, the latter is shown phonetically in parentheses. When two or more places on the map have the same name, they must be identified by reference to other points. A road is designated by connecting two or more names of places on the road by dashes.

1516. The initial combat orders of regiments and smaller units are given verbally. For this purpose the subordinates for whom the orders are intended are assembled, if practicable, at a place from which the situation and plan can be explained.

Subsequent orders are verbal or in the form of verbal or written messages. Verbal messages should not be used unless they are short and unmistakable.

CHAPTER II.—INFORMATION SERVICE.

SECTION I.—DUTIES AND PERSONNEL.

1517. The functions of this service are: (1) To secure information which will favor the movement and employment of the guns; (2) to maintain communication between the various commanders concerned; (3) to provide for the security of the Field Artillery when such security is not provided by the other arms.

Information is usually secured by reconnaissance officers and scouts. Communication is usually maintained by agents acting

as couriers or by signalers, using visual signals, the telephone, or the buzzer. The duties of the two classes are apt to merge into each other and no sharp line of distinction can be drawn between the duties to be performed by the different individuals.

1518. The probable movement of guns and probable occasions for their employment should, so far as possible, be foreseen and special information secured beforehand to facilitate such movement or employment. Thus, on first approaching the scene of expected action, reconnaissance officers and scouts should be pushed well ahead to examine the terrain and to gain early touch with the tactical situation. They should thus be prepared to furnish the Field Artillery commander with information which will assist him in making recommendations as to the posting of the Artillery. After the positions are selected the reconnaissance officers and scouts should secure further detailed information, such as firing data, appropriate routes for approaching and occupying the selected positions, etc., and should be prepared to guide battalions and batteries to their appointed positions. During the progress of the action this personnel is employed to prepare for further movements; to examine positions likely, under certain contingencies, to be occupied; to act as auxiliary observers, reporting on movements of the enemy or of our own troops, and on changes necessary in the adjustment of fire; to maintain communication between the Field Artillery and Infantry commanders, etc.

1519. Communication must be maintained: (a) Between the superior commander and the Field Artillery commander; (b) between the units of Field Artillery and the Infantry which they are immediately assisting; (c) between the elements of the Field Artillery itself.

(a) As a rule, the Field Artillery commander accompanies the commander of the troops during the earlier stages of an engage-

ment and receives the orders of such superior commander in person. As the engagement progresses it may be necessary for the Field Artillery commander to establish his position at a point other than that selected as the position of the commander of the troops. In such cases the duty of maintaining communication between the superior commander and the Field Artillery commander devolves, in general, upon the Signal Corps. If, however, the Signal Corps is for any reason unable to supply such communication, or if it is not ordered, the Field Artillery commander furnishes the personnel and matériel necessary to maintain connection with the superior commander. In every case of absence, the Field Artillery commander is invariably represented at the headquarters of the superior commander by an agent designated from the Field Artillery personnel for the purpose.

(b) When a given force of Field Artillery is told off to render support to an Infantry command in either attack or defense, the Artillery commander should be informed as to the plan of the Infantry commander, and the two commanders should arrange by conference beforehand the definite means of communications, methods, etc., to be used to insure close cooperation. To insure effective cooperation it is essential that the Field Artillery be kept informed as to the losses sustained by the Infantry, the particular part of the hostile line from which the fire causing the greatest losses comes, the movements and any change of plan of our Infantry, also as to when it is necessary to begin, increase the rate of, or cease firing. An Artillery reconnaissance officer with Artillery scouts, or Artillery scouts alone, may be employed to establish the requisite means of communication, which may be by courier, signals, telephone, or buzzer. The reconnaissance officer and scouts also report on the effect of the Field Artillery fire and furnish such other technical data as they may be able to obtain. It may frequently be necessary for

the Infantry to furnish additional means of communication. Especially is this necessary during the last moments of an assault, when previously concerted signals for the cessation or shifting of Field Artillery fire must, as a rule, be given from the Infantry firing line.

(c) Communication between the various elements of the Field Artillery is maintained by members of the headquarters company and special details.

1520. The personnel assigned to regimental and battalion headquarters for the performance of the duty of information and communication is shown in paragraphs 583 and 569. The agents are designated in time of peace, and, while ordinarily remaining on duty with their respective batteries or battalion sections of the headquarters company, they report to the regimental or battalion commander at all regimental or battalion formations.

In each battery two corporals are detailed as battery scouts and one corporal and two first-class privates are detailed as battery signalers.

At each Field Artillery brigade headquarters, the brigade adjutant acts as reconnaissance officer and the two aides-de-camp as agents.

1521. In general, commanders of Field Artillery brigades, regiments, and battalions employ the members of their own headquarters detachments and of the Headquarters Company for securing the information required at their headquarters and for transmitting information and orders to the next lower commanders. When necessary, however, brigade and regimental commanders call upon the next lower units for details to assist in securing information or in transmitting information and orders. Thus, when extensive reconnaissance is necessary for obtaining information upon which to base his recommendations

for the preliminary deployment of the Field Artillery, the brigade commander may call for details of reconnaissance officers and scouts, to be employed under the immediate direction of the brigade reconnaissance officer. When such a reconnaissance has been made, the employment of the guns is usually facilitated by assigning organizations to positions which have been covered during the preliminary reconnaissance by the officers and scouts detailed from the particular organizations.

Within the battalion the battery reconnaissance officers are habitually employed under the direction of the major during the preliminary reconnaissance and as long thereafter as their services may be required.

1522. The exact manner in which a headquarters detachment or the men of the Headquarters Company should be employed depends upon circumstances. To meet the requirements of the average case the members of the detachment are assigned normal duties in accordance with the individual aptitudes of the men; but each man, including mounted orderlies, saddlers, etc., should be so instructed as to be available at any time to assist in the duty which is then most important.

Regimental and battalion sergeants major, as assistants to reconnaissance officers, should be experts in all the duties involved.

1523. As a rule, the battery acts as a part of a battalion, and scout duty at a distance from the position is, so far as practicable, performed by the battalion scouts; the battery scouts should, however, be thoroughly trained not only as scouts but also as agents, signalers, and in the use of the service buzzer.

1524. In each headquarters detachment or Headquarters Company the men employed on the less-important duties are the substitutes for the more-important positions, the vacancies

in less-important positions being filled by men selected from the batteries.

In each battery two details, a permanent and a substitute, will be trained.

Each headquarters detachment is instructed by its adjutant.

During periods devoted to individual instruction, the battery details, both permanent and substitute, will be instructed under the close supervision of the battery commander by the lieutenant designated as battery reconnaissance officer. During the latter parts of such period of instruction battery reconnaissance officers and their details will be instructed by the battalion adjutant under the supervision of the major.

Battalion and regimental commanders give such instructions and exercise such supervision as may be necessary to insure proper training and the development of uniform methods in signaling, telephoning, and telegraphing.

During the period devoted to battery instruction the battery signalers should be frequently assembled for practicing intra-battalion or intraregimental communication. Advantage must be taken of terrain exercises without troops, and of all battalion and regimental exercises, to train and develop the entire personnel pertaining to the information service.

SECTION II.—DUTIES OF SCOUTS.

1525. To secure information which will facilitate the movement and the employment of Artillery is the special function of Artillery scouts.

The movement of Artillery is facilitated, for example, by determining the practicability of a given route; by exploring a section of country and selecting the best routes for traversing it; by locating any bodies of the enemy which might obstruct the movement, etc.

The employment of Artillery is facilitated, for example, by determining the dispositions of the enemy, the dispositions of our own troops, and such changes in these dispositions as may occur from time to time during the progress of an action; by observing the effect of our fire and indicating, if necessary, corrections which will insure its proper adjustment; by reporting the arrival of hostile parties within dangerous proximity of the Artillery position, etc.

The special functions of scouts are, then, to reconnoiter, to observe, to report.

1526. On minor duties scouts may operate singly. Ordinarily, however, they operate in pairs and accompany a reconnaissance officer. When operating in pairs without a reconnaissance officer, one of the scouts devotes his special attention to gaining the desired information, the other looks out for safety, keeps track of the route followed, and watches for signals from the unit to which the scouts belong or from neighboring scouts, etc.

In specially important cases a patrol consisting of a number of scouts under a reconnaissance officer may be employed.

Scouts operate according to the rules laid down for patrols in Field Service Regulations, so far as these rules are applicable to their more restricted functions. When sent on a duty they are to be given explicit instructions as to the information required, as to the place for reporting, and as to the time available for securing the desired information. Full latitude is to be allowed them in the choice of ways and means to carry out the duties imposed.

1527. The nature of some of the duties to be performed by scouts is indicated below:

1. In reconnoitering a designated road the scout prepares himself to report especially upon: Its general practicability

for Artillery; pioneer work needed, if any; condition of the road as effecting rate of march; strength of bridges; the existence of defiles on the road, such as causeways, bridges, narrow valleys, etc.; practicability in general of leaving the road and moving across adjacent country; existence of intersecting roads, with direction and destination.

2. In selecting a route to a given point the scout endeavors first to get a good view of the terrain. If no road exists in the desired direction, he studies the lay of the ground and judges where the most practicable route will be. If possible, he selects certain landmarks on the proposed route, from which good views can apparently be obtained, and proceeds rapidly from one to another, studying the country as he moves. Having determined a practicable line of advance to the given point, he may make more detailed investigations as he returns.

When the advance to an Artillery position is in question, it is especially desirable that scouts should examine all the ground in the neighborhood of the position, so as to be able to lead officers or batteries quickly to any part of it.

3. In reconnoitering a route, scouts must be especially careful to note landmarks, to turn frequently and look at the country which they have passed, and to take such other measures as will enable them surely to retrace their steps either by day or night. Practice in moving at night is particularly important for scouts.

4. When sent to examine a place in which an enemy may be concealed—for example, a wood, a defile, a village—scouts first examine its approaches, its edges, and, if possible, its exits; they endeavor to reach a position from which they can overlook it; ordinarily, one scout or one party should observe while another passes through the suspected place.

If preceding the column by only a short distance, scouts must act with great promptness.

5. When the information at hand as to the location and disposition of the enemy is insufficient, scouts may be pushed forward to secure this information, both by personal reconnaissance and by communicating with our own advanced troops. In such cases they should fix in their minds the lay of the ground near the enemy's positions, noting such landmarks and making such sketches as will enable them to give a clear description of his situation. Similar information should at the same time be secured with regard to our own troops.

6. During an action, when observation of fire or of the terrain is difficult, parties of scouts may be sent to occupy positions from which they can keep their commander continually informed as to the efficacy of the fire and as to changing conditions in the field of action. Thus they should be able to verify the presence of the enemy in a certain locality and report his situation and dispositions with reference to certain landmarks; to report the arrival of bodies of the enemy in a given position or their departure therefrom; to report the positions occupied by our own troops, the possibility of firing over them with safety, and special ways in which the guns may be of assistance to them; to report whether or not our fire is properly adjusted, indicating such corrections as may be necessary.

7. As a general principle, Field Artillery in position is safeguarded by troops of the other arms; but when posted in exposed positions, as, for example, on the flank of a line, it is incumbent upon the Artillery commander, as an additional precaution, to post scouts where they may, by suitable signals, give timely warning of the approach of hostile parties.

8. The information secured by a single scout is ordinarily communicated by a verbal report. In the case of a patrol, however, it is often advisable for the patrol commander to send concise written reports, giving important information as it is

secured. These reports should be supplemented by a sketch on which is indicated the important information secured. A route sketch should be on a scale of 3 inches to the mile. A panoramic sketch of the enemy's position should show angular distances in mils between important points. The point from which the sketch was made should be clearly stated and should, if practicable, be indicated on the route sketch.

Scouts acting as auxiliary observers during an action report, if possible, by wire; otherwise, by signals with flag, heliograph, or lantern.

In communicating with each other for the purpose of indicating a change in the direction of march, scouts employ the signals prescribed in these regulations.

The whistle or the arm signal is used for attracting attention.

To indicate danger, enemy in sight, both arms are raised vertically. The arms are raised and lowered energetically several times if the danger is imminent.

1528. Additional details relating to the duties of scouts are to be found in paragraphs **1615** and **1646**.

SECTION III.—TRAINING OF SCOUTS.

1529. For scout duty, alert, cool-headed, and intelligent men should be selected; they should be good horsemen and have good eyesight and good hearing.

Each scout should be provided with a good field glass, a compass, a watch, a whistle, a pocket message and sketch book, a pencil and a combination flag kit.

1530. The training of a scout should have for its object:

1. To develop his powers of observation.
2. To teach him what to look for and how to recognize it.
3. To teach him how to report intelligently and concisely.

The scout's powers of observation and description are developed first of all by simple exercises. Thus he may be required to look at a given section of terrain and describe what he sees in it.

The scout is made to appreciate the lay of the land as indicated primarily by its drainage, and secondarily by other natural features, and by the works of man. A good eye for country is thus to be acquired; the scout learns to appreciate the configuration of a terrain which may be only partially visible to him, and thus to deduce the most favorable routes for traversing it and the most probable positions for hostile occupation.

The scout must also be taught to distinguish troops of the different arms, to recognize their formations and to familiarize himself with their usual methods of action.

The scout must be trained (*a*) to use field glasses; (*b*) to read maps; (*c*) to make reports, both verbal and written; (*d*) to make route sketches; (*e*) to make panoramic and position sketches; (*f*) to signal; (*g*) to operate telephones.

SECTION IV.—AGENTS.

1531. Agents are employed to act as mediums of written or oral communication between the commander and the elements concerned. They keep the commander informed as to the location of the several elements and the best route for approaching them, guide the elements into new positions when necessary, and transmit information between the commander and troops of the other arms.

Each battalion and higher headquarters is provided with sufficient agents for linking the commander with the next higher units of his command. For cases which may require a

greater number of individuals than are thus provided, the subordinate commanders detail the necessary additional men. For example, commanders of combat trains detail men to act as agents in keeping the appropriate higher commanders informed as to the position of the combat train and for maintaining communication between the higher commander and the combat train. Likewise, when the commander of the Field Artillery of a division or of a smaller force acting independently is not with the commander of the troops, the former leaves his adjutant or an appropriate individual to represent him at the headquarters of the command. An important function of the agent so left with the commander of the troops is to obtain and to keep the Field Artillery commander advised of all information which may assist or otherwise affect the Field Artillery.

1582. Agents are especially trained and exercised in carrying verbal messages; in map reading, so that they may be able to identify positions or roads pointed out to them on the map; in simple sketching, so that they may be able to indicate relative positions of troops, features of the terrain, etc.; in finding their way, both by day and night, to designated distant positions; in signaling; in the use of the service buzzer.

Certain details in connection with the performance of courier duty by agents are noted below:

(a) A courier makes every effort to keep himself informed as to the location of the subdivision to which he pertains and as to the route by which it may be most readily reached.

(b) When sent on a mission he notes carefully the country traversed, the facilities and difficulties which it offers for the passage of Field Artillery, and endeavors to impress upon his mind the features of the terrain so that he would be able to guide troops through it if called upon to do so.

In pursuing a given route for the first time, it is advisable to turn frequently and observe how objects appear after they have been passed; retracing the same route is thus much facilitated.

(c) He moves promptly when on an errand, and allows nothing to delay or interrupt him. All military persons are required to expedite the movements of such messengers and to point out promptly the best routes for reaching the subdivision or individual sought.

(d) On reaching his destination, if the individual sought is not immediately seen or recognized, the courier calls out the name or military designation of the person sought: e. g., "Commanding officer, Battery A, First Field Artillery." It is not necessary for a mounted man carrying a message to dismount when addressing or addressed by a dismounted officer.

(e) Having delivered the message he waits in the presence of the individual receiving it until notified whether or not an answer is to be taken. In case of delay he asks for instructions.

Important messages should always be in writing and should be acknowledged by the receiver's initials on the envelope, with date and time of receipt.

Verbal messages should always be repeated by the courier in the presence of the sender before starting on the errand. The message should be couched in concise terms. The sender should make sure that the courier grasps its spirit and meaning.

If a courier is aware of the nature of the message carried and has noted any circumstances bearing upon its subject matter since leaving the sender, he should, after delivering the message, report the circumstances.

(f) If a courier, after diligent search, is unable to find the individual to whom he is sent he endeavors to find some other person who can take full advantage of the information con-

veyed. Whether or not this can be done, he always reports back to the sender with full facts in the case.

It is the duty of all subordinate Artillery commanders to notify the next higher commander when circumstances require them to make a material change of position without the knowledge of the latter.

(g) A courier should note matters of military interest, especially those affecting the subdivision to which he pertains, and should make report of any essential matters on his return to the officer to whom he is assigned.

If he carries an order directing a change of position of a subdivision, it is often advisable to direct him to accompany the subdivision into the new position so as to enable him to become familiar with the ground and to be able to report upon conditions in the new position.

SECTION V.—ROUTE MARKERS.

1533. It is incumbent upon an officer preceding his command for reconnaissance or other purposes to mark the route so that uncertainty may not arise on the part of those in rear as to the route to be followed.

The individuals employed on this duty are termed route markers. All enlisted men belonging to headquarters detachments and to battery details are trained in the performance of this duty.

The sergeant major of a battalion or regiment or the first sergeant of a battery is charged with the details of the service, thus leaving the commander to devote himself to the reconnaissance or other work.

Within a column it is the duty of each element to maintain touch with the element next preceding it.

1534. A marker is made to understand clearly:

- (a) The route to be followed.
- (b) The particular organization to be guided.
- (c) The message, if any, to be delivered.
- (d) The route he is to follow in order to rejoin the commanding officer.

The marker indicates the correct route, acting as guide if necessary over terrain where the route is difficult to follow, and as soon as his mission is fulfilled hastens to replace the next marker or to rejoin his detachment or detail. If necessary, mounted men may be temporarily taken from the organizations of the command to increase the number of markers. The number employed, however, should always be the minimum consistent with insuring the uninterrupted march of the command.

By the establishment of well-understood conventions, or by the use of suitable signs, the number of markers may be reduced. Thus, it should be understood that a main traveled road is not, without indication, to be left for one that is noticeably less traveled, and that a straight road is not, without indication, to be left for one which deviates from it. By marking arrows on trees and buildings, or by other suitable signs, uncertainties of a minor nature may be removed. In important cases, however, a marker should always be left at places where a reasonable doubt may arise.

When the head of the column for which the route is being marked comes within view of a marker the latter signals the former, and the former acknowledges with a countersignal. Both signal and countersignal should be distinctive and should have been previously agreed upon. The same signal and countersignal are used throughout the detail.

CHAPTER III.—LOCATION IN THE COLUMN OF MARCH, SECURITY AND SUBDIVISION FOR ACTION.

1535. Artillery is usually placed in the column of march so that its early entrance into action is facilitated and its security insured by the other arms. These two considerations are frequently antagonistic, therefore in any situation both should be considered but the more predominant should have precedence.

In an advance, its entry into action is generally facilitated if its deployment or its maneuvering area to position is in the direction of the enemy rather than to the rear; in a retreat, if its deployment is away from the enemy.

In an advance the Artillery of the main body is generally well forward in the column, while the Artillery of the advance guard is well to the rear of that formation, generally with its reserve. Under certain circumstances of an advance, as when the hostile resistance takes the form of annoyance by small bodies and in a **pursuit**, a part or all of the Artillery of the advance guard may be farther forward in that formation.

Under special conditions such as a night advance, or operations to the front in terrain where Field Artillery would have no chance to deploy or to fire, or operations that must be begun exclusively by troops of the other arms the Artillery may be placed in the rear of the combatant column.

1536. In a retreat, any Field Artillery not assigned to the rear guard should generally march near the tail of the main body, while that assigned to the rear guard is placed in column according to the requirements of the special situation.

1537. The position of the Artillery in column in flank guards is dependent on the foregoing principles of expedition of entry into action and of security, and upon the special tactical situation, in which the probable direction of hostile opposition is the dominant feature.

1538. The position in the march column of Horse Artillery operating with Cavalry is governed by the foregoing principles. Wherever placed in the column it is important that it march united.

1539. In close country or under special conditions, security may require the interpolation of troops of the other arms between the Artillery regimental or battalion units.

1540. While the general security is provided on the march, as in combat, by the other arms this fact does not justify the neglect by Artillery commanders of necessary measures for immediate security.

1541. In order that he may obtain early information, the commander of the Artillery of each separate column usually accompanies the commander of the troops on the march. Similarly, the commander of an Artillery unit assigned to the advance or rear guard accompanies the advance or rear guard commander.

1542. Before occupying a position for action the batteries of a Field Artillery command are habitually subdivided as explained in paragraph 550.

The place and time for subdivision are determined by the circumstances of the case. From a purely Field Artillery point of view it is desirable that the subdivision should not take place too soon, as the interposition of other troops might then render it difficult for the combat trains to remain in effective touch with their firing batteries. On the other hand when action is imminent, the commander of the troops will frequently order the combat trains detached and assign them to a march position separated from their firing batteries so as to expedite the entry into action of a part of the Infantry.

The supply companies are habitually consolidated with the supply companies of the other arms.

1543. When the combat trains are not detached and combat with the enemy is possible, they are assembled and marched in rear of their battalions. Agents are sent to the battalion commander. In this case the combat trains are required to fall out of the column when a suitable place near the position to be occupied is reached.

1544. When the combat trains are detached they are habitually assembled by battalions. Each group of battalion combat trains thus formed is commanded by the senior present therewith. The various groups assemble in the march column in the same order in which the battalions to which they pertain are arranged in the column of march. When desirable each regimental or brigade commander assigns an officer to command all the groups belonging to his unit. The functions of this officer with respect to any battalion unit cease at the moment its battalion commander sends orders as to the position to be taken by his group. The assignment of senior officers to command the combat train groups during the march will frequently facilitate the movements of the combat trains.

1545. Whenever the combat trains are assembled by battalion groups, careful arrangements must be made to assure the maintenance of communication to include that between the firing batteries and their combat trains. Each consolidated battalion combat train sends an officer to accompany its battalion commander and to act as agent between the latter and his group of combat trains. This agent is habitually accompanied by an orderly and by the chief mechanic of each of the batteries of that battalion. Whenever necessary, additional mounted men are detailed from the combat trains to accompany the officer who acts as agent.

CHAPTER IV.—CHOICE OF POSITION.

SECTION I.—THE FIRING BATTERIES.

1546. The area within which the Field Artillery must take position is determined by the tactical situation and the plan of action decided upon by the commander of the troops. The Field Artillery is not free, therefore, to choose its own position, but must make the best use of the terrain within the limits thus imposed.

1547. The commander of the troops designates the areas or places near which the Field Artillery is to take up its positions and influences the distribution of the units by a general indication of the tasks to be performed.

The Artillery commander distributes the areas to be occupied among the regiments or battalions of his command and assigns duties to those units.

In many cases it may be practicable to embody the assignments, etc., made by the senior Artillery commander in the order given by the commander of the troops.

Regimental commanders amplify the orders of the senior Artillery commander as may be necessary, particularly with reference to ammunition and other supply and the lines of communication.

Battalion commanders assign their batteries to positions or areas in which to take position, and assign targets or sectors of attack or observation.

Since the proposed plan of action influences the choice of position, it is important that all of the above commanders transmit to their subordinates all available information as to the plan of action and the part to be taken by their respective units.

1548. The only invariable rule in the choice of a position is so to post the guns as to be able to carry out effectively the task assigned them.

Important considerations in the choice of a position are:

1. Obtaining an effective range.
2. Securing a large field of fire.
3. Concealment from view.
4. Facility of movement to the front, flanks, and rear.
5. Proximity of good cover for teams.
6. Favorable conditions for resupply of ammunition.

Positions combining all of the above qualifications are seldom or never found. The choice as to which consideration carries most weight depends upon the tactical situation.

1549. By a suitable choice of positions and of observing stations the greater part of the terrain within range of the guns may be included within the field of fire. Concealed positions and indirect laying are habitually used. Certain conditions require positions in the open from which direct laying may be used.

1550. The existence of dead spaces may be obviated and the field of fire enlarged by the skillful disposition of the units of a Field Artillery command.

By an intelligent dispersion of units the effect of the enemy's fire is diminished and his difficulties in adjustment increased. Good organization of the services of information and communication may secure concentration of effort even though the units be widely separated. Such separation, however, increases the difficulties of command.

1551. When not incompatible with the effectual accomplishment of the duty to be performed, concealment from view is always to be sought. This is true whether direct or indirect laying is employed. By rendering the guns inconspicuous or entirely concealing them their sustained service may be counted

upon, while the difficulties of the enemy in locating his targets and adjusting his fire are increased.

1552. Skill in the concealment of guns is to be acquired by careful study of ground and by extensive experience on a varied terrain. The following suggestions are to be noted :

Positions which, from the enemy's point of view, are on the sky line are usually the most conspicuous. By placing the guns below the sky line, so that they will have a favorable background and by preventing movements of the personnel, a battery may be unrecognized, even though it is in the open. It is important, however, to have a crest, a hedge, or a clump of trees in front so as to increase the enemy's difficulty of observation and of exact location. In the absence of natural cover artificial means may be used to conceal the guns.

A position in rear of a crest, with a parallel crest of about the same height in front and some distance away, offers many advantages. The enemy is apt to mistake the crest nearest him for the one actually occupied and to consider shots falling between the crests as beyond his target. Trees, a hedge, standing grain, etc., 400 or 500 yards in front of the guns, and so that the line of sight just passes over them, may similarly serve to deceive the enemy as to the actual position.

When indirect laying is to be employed, a position on a gentle slope just far enough behind the crest to insure the concealment of the flashes best facilitates running the guns up to the crest should direct laying be called for. If the position is discovered by the enemy, however, and the crest is plainly seen by him, the guns are in a very vulnerable position, as shrapnel may be employed to search such a reverse slope very effectively.

The most advantageous position, from the point of view of concealment alone, is one more than 400 yards in rear of a covering mask, having flash defilade and hidden from the view

of any auxiliary observers whom the enemy may push to the front and flanks.

A position on the counter slope is frequently advantageous in reducing dead spaces, facilitating ammunition supply, and securing suitable observation stations near the guns.

1553. Ruses.—Dummy emplacements suitably prepared will often serve to deceive the enemy, distract his attention, and cause him to waste ammunition.

A few guns may be sent to occupy detached positions, with a view of drawing the enemy's fire and leading him to disclose his position and strength. Such guns should be posted with wide intervals; their rapidity of fire may be utilized to produce the impression of a large force of Artillery.

1554. Firing over friendly troops.—Firing over our own troops is to be regarded as a normal procedure.

Freedom is thus gained to post Artillery so as to cover effectively the whole front of the combat and to realize the power of concentrating the fire of widely separated lines.

Projectiles should clear friendly troops by at least 10 yards. Fire over them should not be conducted with elevations of less than 1,000 yards, or when they are within 400 yards of the guns. These limitations are modified by the relation between positions occupied by the target, the friendly troops, and the guns.

SECTION II.—LIMBERS, COMBAT TRAINS, AND AMMUNITION TRAIN.

1555. The preservation of the ability to move Artillery depends upon the protection of the teams from hostile fire.

1556. The limbers.—The position to be occupied and the formation to be taken by the limbers depend upon the nature of the cover available. To secure the maximum protection and to

have free and prompt access to the guns are the objects in view in the choice of position for the limbers.

Concealment from view and protection from fire as well are secured by placing the limbers behind vertical cover. When such cover is available the limbers are ordinarily placed in section or double section column parallel to the cover.

Ridges having easy slopes afford concealment from view. They do not, however, afford protection from searching fire. The effect of searching fire in such cases may be avoided or greatly reduced in amount by placing the limbers more than 400 yards in rear of the covering crest.

If the limbers can not be echeloned with respect to the firing batteries, they should be at least 500 yards in rear of the guns.

When it is impracticable to conceal the limbers from the view of the enemy, they should be posted as far from the guns as the conditions of the case warrant, and formed in line, faced toward the enemy, with as wide intervals between carriages as the ground will permit.

1557. The combat trains.—In action the battery combat trains are usually united and are posted as a battalion group. For a position for the group the first considerations are protection from the fire of the enemy and covered approaches to the firing positions of all the batteries. Other considerations are: Ample space to permit parking the carriages with considerable intervals; ease of access to roads running back toward the position of the distributing station established by the ammunition train; facilities for visual communication with the battalion and battery commanders' stations. •

While it is desirable that the greatest distance between the group of combat trains and any firing battery position be not over 1,000 yards, this may be somewhat increased when ample cover is not available.

1558. Artillery ammunition train.—This train is usually directed by the commander of the troops to proceed to some central point from which roads radiate to the position, and there place itself at the disposal of the Artillery commander. The place selected depends upon tactical considerations, the terrain and communications. Its first position is usually 2 or 3 miles in rear of the firing batteries. The operations of the Artillery ammunition train after arrival at this point are controlled by the Artillery commander. The train makes all dispositions to secure prompt resupply of the batteries in ammunition, men, matériel, and horses.

CHAPTER V.—DEFILADE AND COVER.

1559. The best protection from hostile fire is concealment.

1560. The principal means of concealment is the defilade of the guns from all points within the enemy's position. Complete concealment requires the flashes of the guns to be invisible from the enemy's position. Such concealment requires in daylight a defilade of about 4 yards.

1561. In the selection of a position it is necessary to determine the defilade which can be secured while keeping the trajectory, at the shortest range to be used, above the mask affording the concealment.

1562. When direct laying is to be used the necessity for seeing the target through the sights fixes the position to one very near the line from the mask to the target. Similarly, little concealment is possible when very short ranges must be used.

1563. When time and instruments are available a position of the guns for indirect laying may be accurately determined so as to obtain the greatest defilade consistent with the terrain and the range to be used.

Very frequently, however, the approximate position of the guns or, conversely, whether or not the trajectory will clear the mask when certain ranges are used must be determined during a rapid reconnaissance and when instruments are not available.

1564. Training may enable officers to make approximate solutions of the problem by simple estimation (1175). Simple methods based on approximate measures may give still more accurate results.

Such methods are dependent upon the angles of elevation corresponding to the various ranges. For the 3-inch guns these angles may readily be remembered. For 1,000 yards the corresponding elevation is approximately 20 mils; 2,000 yards requires 50 mils elevation; 3,000, 90; and so on the difference in elevation corresponding to successive ranges increasing in arithmetical progression.

1565. When the position considered is on the reverse slope the possible positions in which the guns may be placed may be determined as follows: The observer, mounted, places himself so that the target or terrain on which the target is expected is just visible over the covering crest. If the distance of the observer to the crest is 60 yards or over the guns may be placed anywhere on the reverse slope so long as this slope remains approximately regular and yet be able to clear the crest at ranges of 2,000 yards and over.

This method rests on the assumption that the height of the eye of a man mounted is about 3 yards above the ground. Since the observer mounted is so placed that the line from his eye to the target is tangent to the crest, the slope, when he is 60 yards from the crest, is 1 on 20. A slope of 1 on 20 is equivalent to an angle of 50 mils, which corresponds to a range of 2,000 yards.

If the distance of a dismounted observer is 40 yards from the crest when the target is just visible above the mask, the guns may be placed somewhat down the slope from the observer and yet be able to fire at a range as short as 2,000 yards. The reasons for this are similar to those outlined in the preceding paragraph.

1566. Similar methods to those above described enabled a reconnaissance officer to approximate the least range corresponding to a position on any reverse slope. The height, about 1 yard, of the axis of the bore above the ground as well as the errors in the assumptions tend toward certainty of the trajectory clearing the crest. When friendly troops occupy the covering crest or when the position of the guns is several hundred yards from the mask, allowance for safety may readily be made.

Thus, if the reverse slope is 1 on 20 and it is desired that the trajectory pass 10 miles above the covering crest, the guns may be placed practically anywhere on the slope and yet clear the crest at a least range of about 2,300.

1567. When mountains are visible in the direction of the targets or when certain cloud conditions exist with sufficient stability, it is sometimes possible to locate a point at a height above the target equal, or nearly so, to the elevation corresponding to the range. When this is possible the position of the guns giving the maximum defilade may readily be determined as follows: From the covering crest select the nearest target, or point, on which fire is to be delivered. With the hand lay off above the target the corresponding elevation and locate the resulting point. Moving down the reverse slope the guns can be placed anywhere so long as this auxiliary point is visible. For example, from the covering crest the observer locates the nearest target and estimates its range as 2,000 for which the elevation is

50 mils. Laying off a vertical angle of 50 mils from the target he locates a certain natural feature. He then goes down the reverse slope until this feature is just visible above the covering crest. This position is that giving the maximum possible defilade. If the resulting position is several hundred yards away from the crest allowance must be made for the drop of the trajectory from the line of departure. Ten mils, for example, may readily be allowed by determining the position from which the located point will appear at that angle above the covering crest.

1568. In rolling country practically any position on the counterslope may be occupied. In more broken country the following method may be of assistance: Locate the point on the counterslope from which the nearest target upon which fire is to be delivered is just visible above the covering crest. Estimate the range to the target and to the covering crest. Determine the elevation corresponding to the range from the covering crest to the target. Consider each unit of the number of hundreds of yards to the crest as one-tenth and multiply the resulting decimal by the elevation just determined. Considering the product obtained as yards and going down the slope toward the covering crest the guns may be placed in any position so long as their vertical distance in yards below the point on the counterslope from which the target could be seen is less than the product mentioned.

For example, standing at the point on the counterslope from which the nearest target is just visible above the covering crest the range to the target is estimated as 2,500 and the distance to the covering crest as 500. The difference, or the range from the covering crest to the target, is 2,000 and the elevation corresponding to 2,000 is 50. Multiplying 0.5 by 50 we obtain 25. The guns may be placed 25 yards vertically below the observer.

This method makes ample provision for certainty in clearing the covering crest.

1569. When the terrain to be occupied is flat and the cover is afforded by trees, buildings, etc., the least range for any position may be found by measuring the angular height of the mask from the position. The range corresponding to an elevation equal to the resulting angle is the least range. Conversely a position from which a given least range may be used may be found by taking the corresponding elevation and determining the point from which the angular height of the mask is equal to the elevation. To provide for certainty of clearing the mask the range considered should be that from the mask to the target.

1570. When the position is on a reverse slope the guns must be moved nearer the crest as the least range is reduced. As there are two positions on most practicable reverse slopes, one fairly near the crest and the other at a considerable distance from it, corresponding to a given least range the foregoing statement is not strictly exact, but as the position at a considerable distance from the crest requires accurate determination, the rule is applicable to practical use.

When the position is on a counterslope or on flat terrain the guns must be moved away from the crest or mask as the least range is reduced.

1571. Positions which are seen against the sky from the enemy's line are particularly visible. Similarly any position which tends to give matériel or personnel a clear definition as seen from the enemy's position increases the exposure.

Positions in the shadow of trees, against a neutral background, in weeds, brush, or growing crops greatly decrease the visibility.

The outlines of matériel may be broken by tying branches, etc., to the caissons, wheels, and other parts.

The dust raised by the discharge of the pieces may be reduced by wetting the ground or by covering it with wet straw, branches, or other noninflammable material.

1572. Protection from observation by aircraft is obtained by posting the guns under trees, by placing brush or small trees around the guns, by providing an overhead screen of the same color as the surrounding terrain, and by any means of breaking the outlines of the matériel. Complete immobility on the part of all the personnel during the time that hostile aircraft are in observation is also an important means of avoiding notice.

1573. While concealment from view is of great importance, material cover must never be neglected. Especially when large forces are engaged, the lulls in the action provide ample time which can be utilized in the preparation of artificial cover.

1574. As soon as possible after the occupation of a position the executive, under such instructions as the captain may give, begins intrenching by filling in the space between the aprons and the ground and by providing protective cover, preferably by sand bags, between the adjoining wheels of the pieces and their caissons.

The preparation of this cover is secondary only to the actual firing and the supply of ammunition. It is habitual and is carried out by the executive except on the express order given by the captain at the time of occupying a particular position.

Grain sacks or other material suitable for sand bags will be carried on the carriages in campaign.

1575. The first cover provided should be constructed with a view of its being developed into complete protection as the occupation of the position continues.

1576. The plan to be followed depends upon the terrain. Since positions are habitually concealed, parapets may usually be constructed. Such construction is usually independent of

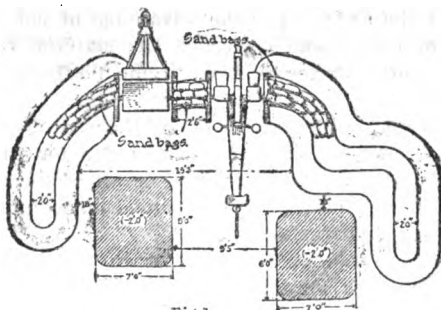


Fig. 1.

Hasty entrenchment for field artillery.

Protection against rifle fire and shrapnel.

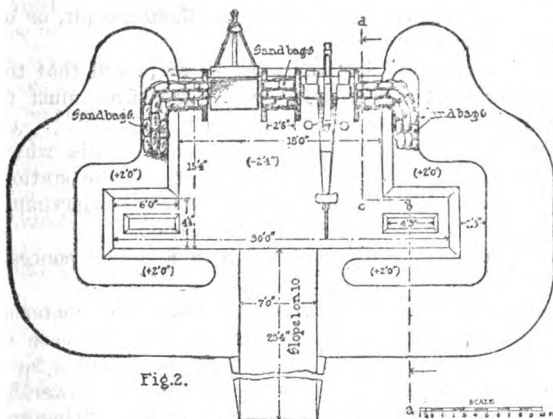


Fig. 2.

Deliberate entrenchment for field artillery.

Suitable type when depression is necessary for concealment.



Fig. 3.

the nature of the soil; it has the advantage of not disturbing the surface of the ground on which the matériel rests. The surface frequently makes a better gun platform than the subsoil.

Suitable protection obtained through the use of parapets is shown in the following diagram. The earth for the parapet may be obtained in part as indicated or all of the earth may be taken from the front, leaving the ground immediately in rear of the carriages undisturbed.

1577. When the position is on flat terrain which is visible to the enemy, gun pits may become desirable to increase the concealment. The diagrams above show a suitable type of pit.

1578. Cover for the executive and the telephone operator at the battery may be obtained by the use of one of the fifth section caissons, by constructing parapets, by digging a pit, or by a combination of these methods.

1579. Since observation stations must be so placed that the enemy's position is clearly visible, special measures must be taken to secure concealment and protection.

Particular care must be taken to avoid movements which might be visible to the enemy in the vicinity of the station. All instruments must be so placed as to secure the maximum concealment consistent with efficient observation.

It is usually necessary to construct both artificial concealment and protection.

1580. The protection which can be afforded to the material is necessarily limited by considerations affecting the ease of service of the pieces. When the position is to be occupied for a considerable length of time it is essential to provide cover, in which the personnel may be secure during lulls in the firing and during the periods in which the men must rest.

Details of the construction of such cover are so dependent upon the terrain, the situation, and the available material that only the most general rules can be prescribed.

Separate cover for each gun squad should be provided in the immediate vicinity of the pieces. Overhead cover against shrapnel and shell fire from the smaller calibers is essential. Overhead protection against the heavier shells is seldom practicable. Two to three feet of earth is, therefore, the usual amount of overhead cover provided. Drainage and other sanitary arrangements are of the greatest importance. The floor space in the cover provided for each gun squad should not be much less than 7 by 30 feet. Separate cover is provided for the executive, his assistant and telephone operator, and for the special details.

1581. In positions which are occupied for several days special care must be taken to improvise facilities for proper cooking by the organization cooks. Cooking places must be under cover at places so located that meals may readily be carried to all parts of the position.

Even though field ranges can not be brought up the utilization of such material as can be had in any inhabited country should make it practicable to avoid the disadvantages of individual cooking.

CHAPTER VI.—RECONNAISSANCE AND SELECTION OF POSITIONS.

SECTION I.—GENERAL PRINCIPLES AND DUTIES.

1582. The duty of locating the enemy and of securing information concerning him devolves in general upon troops of the other arms. It is most essential that the information thus secured should be promptly transmitted to the Artillery. As

successful cooperative action depends in great measure upon the maintenance of quick and reliable communication between the different elements of a command, Artillery commanders should use every means in their power to establish such relations with commanders of the other arms as will insure prompt transmission of information.

1588. The Artillery must, however, obtain for itself such special information as is needed to insure the proper posting and the effective employment of the guns to carry out the tasks assigned it. For this purpose reconnaissances are made by the Artillery commander and his immediate subordinates, assisted by their respective reconnaissance officers and scouts.

The effective action of Artillery is enhanced by (a) selecting at once the most favorable positions; (b) making the necessary preliminary dispositions, such as securing firing data, organizing a suitable information and communication service; (c) preparing concealment and protective cover; (d) posting the guns without the knowledge of the enemy; and (e) opening at the proper time a sudden, unexpected, and overpowering fire upon the designated objectives.

When it is necessary to bring guns into action quickly for the support of other troops, the main consideration is to get them as promptly as possible to a place from which they can render effective support. In such a case, delay occasioned by the search for technical and tactical advantages is entirely inadmissible. A good eye for ground and skill in making use of available cover may, however, even here permit an Artillery commander to post his guns advantageously.

As a rule, though, the necessity for the employment of Artillery may be foreseen and opportunity may be gained for timely preparation.

1584. All Field Artillery commanders habitually precede their commands to the position to be occupied. Every effort should be made to conclude all preliminary arrangements for action prior to the arrival of the firing batteries. Delay in opening fire must not be caused by lack of timely reconnaissance and preparation.

1585. It is essential that the officer commanding the Artillery should be in close touch with the officer commanding the troops. The Artillery commander should accompany the commander of the troops on the preliminary reconnaissance; should be kept constantly informed as to the tactical situation and the plan of action, and should receive early instructions as to the special tasks to be performed by the Artillery. Similarly, subordinate Artillery commanders should be kept informed of the general plan of action and of the situation, so far as it affects them.

At the earliest opportunity the officer commanding the Artillery reconnoiters and selects the positions for the Artillery in accordance with the instructions which he has received and the tactical requirements of the situation. He causes his immediate subordinate commanders to accompany him or informs them when and where they are to report to receive their instructions and undertake their own reconnaissance. It is important that they should reach the ground at the earliest practicable moment.

1586. When a commander rides forward on reconnaissance he instructs the officer left in command on the following points, so far as may be desirable and practicable: (1) The tactical situation; (2) whether or not the command is to follow at once; (3) the time and place for subdivision, if such subdivision has not been made; (4) the route to be followed; (5) the rate of march. Additional instructions may be trans-

mitted from time to time by markers, who should be left at places where uncertainty as to the route may arise or where difficulties are to be avoided. As soon as the position and the best method of approaching it have been determined upon agents or scouts may be sent to meet battalions or batteries and guide them by the most favorable routes to their respective positions.

1587. In undertaking a reconnaissance an Artillery commander should have a clear idea in his mind of the general plan of action and of the task to be accomplished by the force under his command. Unembarrassed by details, he should study the tactical situation and the lay of the ground, select the position with a view of carrying out his special mission, and arrange for the necessary preparatory dispositions. The details of securing information, etc., should be performed by reconnaissance officers and scouts.

1588. It is advisable to attach Artillery reconnaissance officers to advanced troops in order that they may secure early information as to the enemy, and give the Artillery commanders detailed information as to the ground available for occupation by the Artillery and as to the location and disposition of the enemy and of friendly troops. To insure effective cooperation, officers generally accompany the commanders of the Infantry lines during either offensive or defensive action, in order to keep the Artillery commander informed as to changes in the tactical situation and as to the cooperation desired of the Artillery by the Infantry.

Reconnaissance officers of the smaller Artillery units may be attached to the senior Artillery commander, when action is imminent, in order that they may commence, before the arrival of their own immediate commander, the detailed reconnaissance of the position selected for the particular unit concerned.

A reconnaissance officer operating in this manner, as well as one who arrives with his immediate commander, examines the neighborhood of the position, locates his own troops and those of the enemy, prepares firing data, and, in general, secures the necessary information for his commanding officer and relieves the latter of details.

Battery reconnaissance officers are habitually under the immediate orders of the battalion commander on marches in the presence of the enemy.

Scouts may be employed to assist reconnaissance officers and supplement the information secured by them.

1589. An Artillery reconnaissance officer attached to advanced troops should, as soon as possible after the determination of the enemy's location, submit to the Artillery commander a report giving all obtainable information as to the enemy and describing the most suitable position for our own Artillery. This report should be accompanied by a sketch, showing the enemy's position, the position selected for our own Artillery, the characteristics of the country intervening between the two, and such other important information as may be readily set forth. The report should embrace information such as the following relative to the position selected: (a) The various routes of approach and their relative practicability, stating difficulties, if any; (b) possibility of approach under cover; (c) whether direct or indirect laying is recommended; (d) cover afforded for guns; (e) need of providing artificial cover; (f) number of batteries which may be posted advantageously in the position; (g) facilities for protecting the limbers, horses, etc.; (h) facility for resupply of ammunition; (i) in case indirect laying is recommended, possibility of securing good aiming points and good observing stations and of firing over intervening obstacles.

As to the enemy, the report should include information as to: (a) The most important and immediate targets; (b) location and strength of the various hostile bodies; (c) location or probable location of the hostile Artillery.

1590. Whether in a position thus tentatively selected or in one chosen by an Artillery commander, a reconnaissance officer is required in appropriate cases to prepare a sketch of the enemy's position. The known positions of the enemy, and prominent features of the landscape as well, are named or numbered on the sketch; copies of such a sketch being sent to the subordinate Artillery commanders, the indication of objectives may be facilitated. Firing data are also secured by the reconnaissance officer and those pertaining to each important position shown in the sketch are indicated above it in the margin. When individuals using such a sketch for identification of positions are widely separated, allowance must be made for difference in point of view; moreover, in such cases any firing data appearing on the sketch should be carefully marked showing for what position it is appropriate. The position from which it was made should always be plainly described on the sketch.

1591. Scouts may be employed to assist reconnaissance officers and supplement the information secured by them.

1592. Reconnaissance and other duties in the occupation of a position pertaining to various individuals in a force comprising several battalions of Artillery are indicated below; the summary thus given, however, is to be regarded merely as a general guide, and not as specifying all the duties to be performed.

Artillery Commander.

(a) Informs himself as to the enemy's location and dispositions and the general plan of the commander of the troops.

(b) Examines the terrain.

(c) Submits to the commander of the troops recommendations as to the use of and positions for the Artillery.

(d) Assigns the regiments, and, if necessary, smaller units, to duties and to areas to be occupied in accordance with the plan decided upon by the commander of the troops.

(e) Takes general measures to insure communication between the Field Artillery and the other arms, as well as between the elements of the Artillery itself.

(f) Takes general measures for the security of the Field Artillery in combat and its resupply.

(g) Takes definite measures to insure communication between himself and the commander of the troops.

Regimental Commander.

(a) Informs himself as to the enemy's location and dispositions and as to the location and dispositions of friendly troops.

(b) Examines the area assigned his regiment by means of a reconnaissance which should be as thorough as the situation permits.

(c) Assigns the battallions to areas or positions and duties with as much exactness as the conditions permit.

(d) Takes definite measures to insure communication between his headquarters and the troops which his regiment is to support, as well as between his headquarters and the stations of his battalion commanders.

(e) Supplements the arrangements for the security of his regiment and for the supply of ammunition in accordance with the instructions which he has received.

Battalion Commander.

(a) Secures by personal observation and by the employment of reconnaissance officers and scouts information as detailed as possible as to the location and dispositions of the enemy; the location and dispositions of friendly troops; the terrain in and about his assigned position or area—the best methods of approaching it advantageously, its freedom from the enemy, etc.

(b) Examines the general position assigned him.

(c) Assigns the batteries to duties and to positions, indicating the location of their observation stations when such action is practicable and desirable.

(d) Gives such instructions concerning protective cover as may be necessary.

(e) Provides for such auxiliary observing stations as may be needed to secure information as to the effectiveness of our own fire and as to the movements of the enemy and of friendly troops.

(f) Provides for communication with battery commanders and with his auxiliary observers.

(g) Makes sure that the security of the position is provided for by adjacent troops or by scouts.

(h) Selects practicable routes for subsequent possible movements to the front, flanks, or rear.

(i) Provides for the resupply of ammunition, selecting a position for the combat train in case the battery combat trains are united.

Battery Commander.

(a) Examines the targets or sector assigned him and studies carefully the ground in its neighborhood.

(b) Examines the ground assigned him for a position and picks out the most suitable place within the limits imposed for posting the firing battery.

If direct laying is to be employed, he makes sure that each gunner will be able to see through the sights the part of the target to be assigned to him.

If indirect laying is to be employed, he makes sure that each gun will be able to fire over any intervening obstacle, and selects an aiming point, verifying the fact that each gunner will be able to see it through the sight.

(c) Selects a suitable observing station within the limits imposed by his orders and the situation.

(d) Determines the best method of approaching the position, under cover if possible.

(e) Selects the place for posting his limbers.

(f) Selects position for his combat train whenever the battery combat trains are posted separately.

(g) Sends instructions to the executive for posting the battery.

(h) Secures such firing data as may be needed.

The Reconnaissance Officer.

A reconnaissance officer is, in general, charged with:

(a) Securing by personal reconnaissance and the assistance of scouts such information as to the enemy, our own troops, or the terrain as is desirable or ordered.

(b) Supervising the work of scouts, observing parties, etc.

(c) Securing and tabulating firing data, preparing sketches, and securing other information requisite for the direction and conduct of fire.

(d) Observing the field of action, watching for movements of the enemy and of our own troops which may affect the situation, and keeping his commanding officer apprised of changes in the situation.

The Executive Officer.

- (a) Commands the battery in the absence of the captain.
- (b) Conducts the battery to the position selected by the captain.
- (c) Posts the firing battery.
- (d) Makes all preparations necessary to expedite the opening of fire.
- (e) Takes his station near the guns where he can best exercise his functions.
- (f) Verifies the reliability of the communication systems at his station.
- (g) Forms the sheaf as soon as the necessary data are available.
- (h) Attends to the preparation of protective cover and to the immediate security of the firing battery.

SECTION II.—USE OF THE SPECIAL DETAILS IN THE RECONNAISSANCE AND OCCUPATION OF A POSITION.

1598. The method of using the special details in the reconnaissance, selection, and occupation of a position must be sufficiently flexible to be adapted to varied conditions and circumstances. For training the detail a carefully planned system must be followed to accomplish satisfactory results. Such a system is outlined below. When it is used as a basis of training, simulated casualties among personnel and mounts and injuries to matériel, suitable tactical situations and the choice of varying kinds of terrain may be depended upon to stimulate interest, to prevent blind reliance on a fixed scheme, and to adapt the detail to meet emergencies.

1594. When work is to be by battalion the agent reports to and remains with the battery commander until the battery is reported in order, when he is sent to report to the battalion commander.

1595. Three blasts of the whistle is the signal for the battery officers, the first sergeant, and the special details equipped for reconnaissance to report to the battery commander. If necessary the chiefs of platoon and of section call out passing back the command, **Detail**. As the detail rides up it may conveniently form in the following order :

0 Battery commander.
0 Bugler.
0 Instrument sergeant.

Scout No. 2 0 0 Range finder.

Telephone corporal 0 0 Scout No. 1.

Operator No. 1 0 0 Operator No. 2.

Horseholder 0 0 First sergeant.

It is reported to the captain by the instrument sergeant, as, for example, "Sir, the detail is present," or "Operator No. 1 (or such member) is absent, sir."

If the captain or the instrument sergeant desires to verify the detail he commands, **CALL OFF**. The detail calls off in order from left to right and from rear to front. The first sergeant does not call off. (*C. D. and S. R. F. A. No. 1.*)

1596. When the officers, first sergeant, and the detail have reported the captain gives instruction as follows :

1. The tactical situation.
2. Whether or not the command is to follow at once.
3. The time and place for subdivision, or that this information will be communicated later.
4. The route to be followed.
5. The rate of march.

1597. The first sergeant is responsible that the route is marked. Should he be uncertain as to when this is to be done or on any point in connection therewith, he asks the captain for information.

1598. To mark the route the first sergeant calls **Marker** at each point where he desires one placed. Members of the detail fall out and are posted in the same order in which they call off.

1599. The route is marked by the relay method; that is, operator No. 1 relays from battery to operator No. 2; operator No. 2 from operator No. 1 to telephone corporal and so on. An exception to this method is that any marker intrusted with an oral message to the rear, the necessity for which should be infrequent, remains in place until he has delivered it. A written message may be transmitted from a marker to his relief. The horseholder is usually not used as a marker. (*C. D. and S. R. F. A. No. 1.*)

1600. If caisson corporals are available they can profitably be used as connecting files between the battery and the first marker, operator No. 1. They then act as ground scouts by selecting the best route for the battery to pass over and at the same time make it possible for operator No. 1 to keep considerably closer to the remainder of the detail.

1601. The instrument sergeant is always responsible that the detail, when together, rides at a collected and orderly gait and keeps at a suitable distance behind the captain.

1602. On approaching a position the instrument sergeant exercises particular care to keep under any available cover. Ordinarily it will be possible for the detail to halt together in rear of a crest while the captain rides forward to make the reconnaissance. As a usual thing the captain will dismount before he becomes exposed. The bugler, who remains behind,

watches the captain, and when the latter is about to dismount rides up to take his horse. In doing this he comes up on the right of the captain's horse and, without dismounting, takes the reins as they are passed to him. This puts the off side of the captain's horse next to the bugler and leaves the near side free for mounting.

1603. If the captain, in making his reconnaissance, disappears over the covering crest, he is followed and kept in view by the instrument sergeant. If the latter also disappears, he is followed by the range finder, who in turn is followed by scout No. 2, and so on, each man being careful to keep in view the man next ahead. These connecting files remain mounted if the captain remains mounted; they dismount if he dismounts.

1604. When the battery commander calls **Detail** or signals by three blasts of the whistle, the instrument sergeant, scout No. 2, and range finder dismount. Scout No. 2 passes the reins of his horse to the horseholder, who rides up on his left. The range finder links his horse to scout No. 2's horse. The instrument sergeant links his horse to the range finder's horse.

The linked horses having been turned over to the horseholder, these three men approach the battery commander at intervals such that to hostile observation they will present the appearance of Infantry rather than that of a battery staff. The battery commander then states so as to be heard by all three:

- 1. Any later or additional information regarding the situation.**
- 2. The limits of the sector with the location of the enemy and friendly troops.**
- 3. The reference point or points.**
- 4. The target, if known.**

5. The approximate location of the battery commander's station.

6. The approximate position of the guns.

7. The aiming point.

8. Kind of communication.

9. Any necessary instructions relative to artificial cover for the battery commander's station.

If the battery commander fails to give any necessary information, it is asked for. If the range finder and scout No. 2 are not yet up, they secure all necessary information from the instrument sergeant upon their arrival at the station.

1605. The captain may then proceed, mounted or dismounted, to reconnoiter the gun position. In the meantime the instrument sergeant and the range finder set up their instruments, taking the maximum degree of cover which the position affords, and secure the data for the target or targets or for prominent points within the sector. Scout No. 2 from a well-concealed place observes the target, looks for other targets within the sector, and, unless otherwise employed, makes a sketch of the sector.

If time is available, the instrument sergeant and the range finder assist scout No. 2 in plotting prominent points of the sector and in recording firing data therefor.

1606. In open country it will often be practicable to describe or indicate satisfactorily the position for the guns without visiting it. In broken or close country or when the station and the gun position are widely separated or when the position is largely influenced by the covering crest, it will usually be necessary for the captain, either before or after the establishment of his station, to visit and establish the gun position. Often time will be available, and it will be advantageous, although not positively necessary, for him to visit the gun position.

1607. If the captain visits the gun position the remainder of the detail, keeping under cover, follow him in the following order:

	0	Battery commander.
	0	Bugler.
Operator No. 1	0	Scout No. 1.
First sergeant	0	Operator No. 2.
Horseholder with led horses	0	Telephone corporal.

If the captain calls out **Gun markers**, operator No. 1 and scout No. 1 dismount, turning over their horses to operator No. 2, who rides up on the right of scout No. 1.

The telephone corporal, if not already informed, at once asks what kind of communication to establish, dismounts and turns over his horse to operator No. 2. The horseholder finds out where the led horses are to be placed and, upon being informed, he and operator No. 2 dispose of the horses by taking them to the designated place and linking them in a circle, or two and two, head to tail. Operator No. 2 then hastens to assist in establishing the communication ordered.

The battery commander marks either the right or left gun with scout No. 1 or operator No. 1 and places the other man on the line. To aid the executive the man who marks the fixed flank of the battery faces in the direction of fire with one arm extended in the direction of fire and one in the direction of the line of guns. If only a single marker is used he is posted as flank marker.

If not already known to them, scout No. 1 and operator No. 1 will ask as to:

1. The aiming point.
2. The direction of fire.
3. Kind of communication.

(C. D. and S. R. F. A. No. 1.)

1608. If necessary or desirable the captain, accompanied by the bugler and the first sergeant, rides to reconnoiter a position for the limbers, and, in case the battery combat train is posted separately, a position also for the latter. One or both of these positions may frequently be selected prior to the selection of the battery station and marked by one or more members of the detail. All positions being chosen, the captain informs the first sergeant as to:

1. Position for the combat train, whenever the battery combat train is posted separately.
2. Gait for the battery in approaching the position.
3. Any necessary instructions relative to the formation and manner in which the battery should approach and occupy the position.
4. The aiming point.
5. The position for the limbers.

The first sergeant will ask for information covering any or all of these points, if they have not been made clear to him. He then reports to the executive with the above information and guides the battery to the position.

1609. When the first sergeant has received his instructions the captain rides to the vicinity of his station and turns over his horse to the bugler, who goes to the position of the horses belonging to the detail and takes charge of them.

1610. In approaching the position, the executive, in the absence of instructions, understands that the position is ready for occupancy if he sees that the gun markers are posted. If he sees that they are not posted, he halts in a suitable place until they are, or until he receives instructions. In all cases he should reach the position sufficiently in advance of the battery to determine the best method of going into action.

1611. When telephone or buzzer communication is used the telephone corporal sees that operator No. 2 runs out the wire by beginning either at the battery commander's station or the position of the battery, depending upon which is nearer to the place where he left his horse. Ordinarily the wire is run out so as to leave the reel with operator No. 1 at the position of the battery. This permits the buzzer at the station to be plugged in and gotten ready for operation and affords the executive latitude in placing his instrument without interfering with the instrument at the station. Wherever the free end of the wire may be, enough slack should be left to permit considerable movement of the operator. When the command **Close station** is given, the wire is reeled up by the operator who has the reel. The telephone corporal carries the captain's megaphone, and operator No. 1 carries that of the executive.

1612. With obvious modifications one or more of the gun, combat train, and limber positions may be selected before the battery station and designated to the entire detail before or during reconnaissance.

1613. It is to be remembered that the detail should work together as a team. Each man has his particular part to play, but must stand ready to assist or take the place of any man who falls out. Every member should therefore be fully trained in all the duties of the others. In order to perform these duties with intelligence, efficiency, and cooperation, each must be furnished certain information by the battery commander. To this end each member is trained to know what information is required by him for the proper performance of his duties and to ask for any part of it if, at the proper time, the same has not already been made clear to him.

1614. It is the duty of all members of the battery detail to call the attention of the captain, the executive, or other re-

sponsible individual to any obvious error in reconnaissance and occupation of position and in preparation and conduct of fire.

1615. Following is a summary of duties in the battery detail:

Instrument Sergeant.

1. In general charge of the instruments and equipment used by the detail.

2. Forms and commands the detail.

3. Keeps the detail under cover when approaching or in the vicinity of the position.

4. Asks the battery commander, if not already informed, as to:

(a) The situation.

(b) The limits of the sector with the location of the enemy and friendly troops.

(c) The reference point or points.

(d) The target.

(e) The approximate location of the battery commander's station.

(f) Any instructions relative to artificial cover for the station.

(g) The approximate position of the guns.

(h) The aiming point.

(i) Kind of communication.

5. Sets up the telescope and the aiming circle, taking as much advantage of cover as the location of the station affords.

6. Computes the firing data.

7. During firing, keeps or causes to be kept the firing record and renders assistance in observing the fire and in collecting, recording, and transmitting data.

Range Finder.

1. Responsible for the condition and care of the range finding instrument.

2. Acts as route marker.

3. Asks the captain or the instrument sergeant, if not already informed, as to:

(a) The situation.

(b) The limits of the sector, with the location of the enemy and friendly troops.

(c) The reference point or points.

(d) The target.

(e) The aiming point.

(f) Any necessary instructions regarding artificial cover for his station or instrument.

4. Finds the ranges required by the instrument sergeant and scout No. 2.

Scout No. 2.

1. Acts as route marker.

2. Asks the captain or instrument sergeant, if not already informed, as to:

(a) The situation or problem.

(b) The sector, with the location of the enemy and friendly troops.

(c) The target.

3. Observe the sector; keeps the target under observation, reporting change, disappearance, reappearance, movement, or effect.

4. Draws panoramic sketch or map of sector.

5. When not otherwise engaged makes such special observations or keeps such data as may be required by the captain or the instrument sergeant.

Scout No. 1.

1. Acts as route marker.
2. Marks line of guns.
3. Asks the captain or operator No. 1, if not already informed, as to :
 - (a) Direction of fire.
 - (b) Aiming point.
 - (c) If he is to mark a flank gun.
 - (d) Kind of communication.
4. Acts as recorder for operator No. 1, or otherwise assists him in maintaining communication with the battery station.
5. Acts as recorder for the executive.

Telephone Corporal.

1. Under general supervision of the instrument sergeant, in charge of and responsible for all the signal equipment of the battery. He makes such tests and repairs as may be authorized, and at the first opportunity reports to the captain all trouble which he can not remedy.
2. Acts as route marker.
3. Asks the captain what kind of communication to establish, and is responsible that same is established quickly and efficiently.
4. Acts as operator at battery station on the battalion line.
5. When verbal communication is used, he may be required to transmit or relay commands to the battery.
6. Reports to the instrument sergeant or captain when communication is established with the battery or with the battalion station and any breaks occurring.

Operator No. 2.

1. Acts as route marker.
2. Assists the horse holder in placing and linking the horses of the detail.
3. Under direction of the telephone corporal, establishes the kind of communication ordered and acts as operator at the battery station.
4. Reports to the telephone corporal or to the captain when communication with the battery is established or broken.

Operator No. 1.

1. Acts as route marker.
2. Marks line of guns.
3. Asks the captain or scout No. 1, if not already informed, as to:
 - (a) Direction of fire.
 - (b) Aiming point.
 - (c) If he is to mark a flank gun.
 - (d) Kind of communication.
4. Assists in establishing the kind of communication ordered and acts as operator at the battery.
5. Reports to the executive when communication has been established with the battery station and any break occurring.

First Sergeant.

1. Marks the route.
2. Asks the captain, if not already informed, as to:
 - (a) Position for the combat train, whenever the battery combat train is posted separately.

(b) Gait for the battery to use in approaching the position.

(c) Any necessary instructions relative to the formation and manner in which the battery should approach and occupy the position.

(d) The aiming point.

(e) The position of the limbers.

Bugler.

1. Acts as horseholder for the captain.

2. Watches or assists in holding all the horses belonging to the detail.

Agent.

1. Acts as agent between the battalion commander and the battery commander.

Horseholder.

1. Asks the captain where to place the horses of the detail and is responsible that they are secured in that place.

1616. When the detail is reduced the duties may be advantageously distributed as follows:

[illegible]

SECTION III.—USE OF THE BATTALION, BATTERY, AND COMBAT TRAIN DETAILS IN THE RECONNAISSANCE AND OCCUPATION OF A BATTALION POSITION.

1617. Two principles are fundamental:

(a) Battalion agents will be used only by the specific orders of the major or by his express authority in each case.

(b) Battery commanders' details will be left at the disposal of their captains, the only exception being their rarely occasional use in supplementing the battalion detail in marking the route or as connecting files, or for security.

1618. The method of employing details in the reconnaissance and occupation of a battalion position must be sufficiently flexible to be adapted to varied conditions and circumstances. For training the details to a degree of efficient teamwork essential to the effectiveness of the tactical unit a carefully planned system can profitably be employed as a guide. Confusion, indecision, misunderstanding, and annoying and demoralizing delays are the results of training in which plan, system, and method play no part. A suitable system is outlined below. Its application to concrete problems will greatly vary.

1619. Each captain sends the agent to the major as soon as his battery is in order. When contact with the enemy is expected the battery reconnaissance officer is likewise sent to report to the major. When the battery combat trains are united, each battalion group of trains also sends an officer to the major to act as agent. He is usually accompanied by four mounted men, among whom are the chief mechanics. After the position of the combat train has been reconnoitered each chief mechanic is sent to report to the executive of his battery and thereafter acts as agent between the firing battery and its combat train. The fourth man acts as orderly and horse holder. (*C. D. and S. R. F. A. No. 1.*)

1620. In the use of the details two general cases will arise—first, those in which battalion reconnaissance to the hostile front must be made in order to gain contact with the enemy or to determine his location and dispositions; second, those in which such reconnaissance is unnecessary, the major having been ordered to take up a position already reconnoitered and selected by a higher commander. In either case the major will habitually precede his battalion. He will ordinarily have his captains with him. Sometimes they will join him en route. When occupation of position appears imminent, the major should send for his captains and their details or cause them to march at the head of the leading battery. In exceptional cases he will have to send for them after the position has been selected.

1621. It is desirable that a commander should reach a position in ample time for complete and careful reconnaissance, for the formulation of a definite plan, and for issuing the necessary orders so that the position may be occupied and effective fire opened without confusion or delay.

1622. The battalion detail is formed by the sergeant major and is reported by him to the adjutant.

1623. Whenever desirable and practicable the major assembles all officers of the battalion as well as the details for the purpose of giving information and instructions.

Captains verify their officers and details and report to the major. Such officers and details as may be required having been assembled, the major gives information, instructions, and orders covering such of the following points as may be necessary:

1. Information of the enemy and of our supporting troops.
2. Plans and orders of the higher commander.

3. Plan of the major for the execution of these orders:

(a) Approximate distance to and general location of the position to be occupied.

(b) General description of the route to be followed; whether under cover or exposed.

(c) The point, if any, at which the battalion shall await further orders.

(d) Special instructions to the individual batteries, including:

1. Whether or not the batteries march together, with a clear description of any separate routes to be followed.

2. Order of march. Unless otherwise directed, in the absence of the major the captain or the executive of the leading battery conducts the march.

3. Rate of march in miles per hour if not beyond his control on account of the movement of other troops.

(e) Special instructions for the combat train, including:

1. To march with or separate from the battalion, with a clear description of any independent route directed.

2. Probable location with respect to the selected position.

3. Whether the major or the combat-train commander will select and reconnoiter the position.

4. What is known concerning the location of the ammunition-distributing station.

5. Special arrangements, if any, regarding communication with the individual batteries.

(f) Special instructions to the adjutant with reference to reconnaissance or marking the route or connecting, including any special signals to be employed.

(g) Any other necessary instructions, such as:

1. Whether or not the captains with their details will march at the head of the column.

2. Whether or not the major is going ahead at once

3. Whether the battery details will assist to mark the route or to connect.

The command **Posts** is given when all orders and instructions have been announced.

1624. When marching at the head of the column, the battalion detail and those attached may be conveniently formed as follows:

Formation.	Order from left to right.
0 0 0	Combat-train agent; adjutant; major.
0 0 0	Orderlies.
0 0 0	Battalion agents to batteries C, B, A.
0 0 0	Reconnaissance officers of batteries C, B, A.
0 0 0	Orderlies.
0 0 0	Bugler; sergeant major.
0 0 0	Scout corporals, Nos. 1, 2, and 3.
0 0 0 0	Scout privates, Nos. 1, 2, 3, and 4.
0 0 0	Combat-train agents to batteries C, B, A.

1625. If the battery details are directed to march at the head of the column, the captains and their orderlies follow the orderlies of the major and the adjutant; and their details, in the order of the batteries in column of route, follow the battalion detachment. The battalion signal detail and reel cart follow the last battery detail.

1626. Whenever the major is to leave the battalion unaccompanied by the captains, he either assembles and informs them or he informs the senior captain or the commanding officer of the leading battery as to:

1. Any later developments or orders regarding the situation.
2. Whether captains will follow at once or wait until sent for.
3. Route to be followed:

(a) "Bring the battalion on and halt at ———," designating place and route of approach, or indicating same on a map; or,

(b) "I will mark the route"; or,

(c) "Battery details will connect" (exceptional); or,

(d) "Battery details will assist by marking the route." (Exceptional.)

4. Rate of march in miles per hour.

5. Any other important orders or information, including, if necessary, time and place for subdivision.

As soon as these instructions are given, the major, in order to save time, may at once go ahead. The battalion sergeant major marks the route for the batteries to follow. To do this he calls **marker** at each point where he desires one placed, and the enlisted personnel of the detachment, except the battery agents, drop off at that command in the order from left to right and from rear to front of the column. At a suitable point not far from the position the adjutant may call out **Last marker**. At that command the next marker in order takes post at that point. This designation is transmitted to each marker in turn as he arrives. When the battalion approaches, the leading commander is warned, **Last marker**, and causes the battalion to take the most suitable formation under sufficient cover permitted by the terrain; for example, line of batteries in double section column. The batteries remain in this position until they receive orders from their captains or until further orders are received from the major.

Upon the receipt of further orders, the officer conducting the march sends or signals for the personnel necessary and transmits the instructions of the major.

1627. If the battery details have been ordered to connect, they move out at once at a gait designed to overtake the major, the leading instrument sergeant following the route marked by the battalion detail. The instrument sergeant of the detail from the rear battery causes its members to be posted in the order in

which they call off, at such places that each man will preserve touch with the one next nearer the battalion. The signals **Halt** and **Forward** are relayed through these connecting files. The signal **Enemy in sight** (both arms extended vertically overhead) is similarly relayed from the major to the battalion and means **Battery commanders report, details mark the route**. Written messages may be relayed from front to rear or from rear to front. Oral messages are sent by agents.

When the details are used as connecting files, the captains, unless otherwise directed, and the first sergeants always, remain at the head of the battalion.

1628. If, while the battery details are acting as connecting files, the signal **Enemy in sight** is received, the senior, or leading, captain instructs the leading executive to follow the route marked, and the captains, unless they have already been sent for, and their first sergeants ride forward to report to the major. As the first sergeant of the rear battery in the column rides forward, he collects his detail and places them as route markers, the instrument sergeant falling out and accompanying his captain. As soon as the members of the rear detail are placed as route markers, the first sergeant of the center battery continues the marking with his detail, and he in turn is followed by the first sergeant of the leading battery. Thus, if the route is long or lies through difficult country, the captains may reach the major with their orderlies, instrument sergeants, and first sergeants only. If the major, on leaving the battalion, has directed that the route be marked by the battery details, the details are used in the manner first described.

1629. Whenever the route is marked the leading executive notifies the signal corporal, who then takes the reel cart ahead at a trot to report to the major. In guiding the reel cart over the route marked, the markers are careful not to move on after

signaling to and receiving the countersignal from the signal corporal (1584).

1630. On approaching an observing station the adjutant and sergeant major exercise particular care to keep the detail under cover, provided cover is available. Ordinarily the detail halts under cover, while the major and the adjutant ride forward to observe or to report to a higher commander. The major and the adjutant usually dismount and turn over their horses to their orderlies before they become exposed.

1681. On completing his preliminary reconnaissance, or having received his orders from a higher commander, the major or the adjutant calls **Detail** or signals by three blasts of the whistle. The officer from the combat train, the reconnaissance officers, scout corporals, and the sergeant major dismount and turn over their horses, the officers to their orderlies, the scout corporals to the scout privates or to the reconnaissance officers' horse holders, and the sergeant major to the battalion bugler. If the major desires only the officers and the sergeant major to report he calls **Officers**. The officers and men are careful not to expose themselves while reporting to the major.

1682. The major then gives information, instructions, and orders covering such of the following points as may be necessary:

1. Any later information regarding the situation.
2. The general front and limits of the battalion position.
3. The limits of the target sector, with the location of the enemy and friendly troops.
4. The major's station.
5. The locality, in general, where the horses of the detail are to be held or linked and watched, under charge of the battalion bugler.

6. The rendezvous point for the captains with their details, usually a well-concealed point close to the battalion station, but always the point at which the major wishes the captains to report to him.

7. The special reconnaissance of the position which the major desires made by designated reconnaissance officers or scouts.

8. Other special tasks for the reconnaissance officers and scouts, with the adjutant in charge, such as:

(a) Designation of flank or auxiliary observers.

(b) Communication with the higher commander.

(c) Communication with the troops supported by the battalion.

(d) Panoramic or position sketches required.

(e) Reconnaissance or maps of routes to front or rear.

9. Orders to the agent of the combat train covering its movements and post.

1688. An officer or scout ordered to reconnoiter a battery position notes and reports on the following points:

1. Size (whether large enough for the battery).

2. Cover (what defilade can be secured).

3. Field of fire (whether or not designated sector can be covered).

4. Observing stations (whether or not good field of view can be obtained).

5. Kind of communication (whether or not necessary to employ other than voice).

6. Approaches and exits (whether covered or exposed).

7. Protection of flanks (whether afforded by friendly troops or by natural features of the terrain).

8. Aiming points.

9. Presence of friendly troops, if known.

10. Indication of the enemy.

11. Position for the limbers

1634. As a rule the major, as soon as his instructions are given, rides over and familiarizes himself with the position to be occupied. If he has sufficient time he locates the battery positions within narrow limits. He may find it advisable, unless his captains are present, to leave an agent to mark the position of each battery. Each agent so left rejoins the major as soon as he has given the necessary information to the captain concerned. The adjutant, if not already there, goes to the battalion station where he executes the orders of the major and keeps in touch with the tactical situation. If the adjutant has been given a task which takes him from the station, which should be an exceptional case, the major himself goes or remains there.

1635. The major usually sends the agent of the group of combat trains, accompanied by the battery agents of the train, to reconnoiter the position for the combat train. The other agents remain at the major's disposal and are to be used by others only by his specific authority in each case. The battalion bugler accompanies the sergeant major to the rendezvous point for the captains. As soon as the reel cart arrives the sergeant major removes the necessary instruments and has them carried to the station.

1636. After receiving the orders of the major the battalion combat train agent makes a detailed reconnaissance of the position to be occupied by the combat train and of the approaches thereto. He then directs the chief mechanics to join their executives and, unless otherwise specifically directed, returns in person to the commander of the group of combat trains and guides it to its position. When the combat trains have been placed in position the agent so reports to the battalion commander.

Upon being directed to report to their executives the chief mechanics return to the vicinity of the battalion commander's station, ascertain the positions occupied or to be occupied by their batteries and rejoin their executives as soon as practicable. Each chief mechanic secures his horse as near the position of his guns as practicable.

1637. The captains on arrival at their rendezvous point are given such of the following information and instructions as may be necessary:

1. Any later information or orders regarding the situation.
2. The mission of the battalion.
3. The limits of the target sector for each battery and information thereon, including:
 - (a) Location of the enemy and friendly troops.
 - (b) The battalion commander's reference point or points.
 - (c) The target or targets if known.
 - (d) The communication that has been established with friendly troops.
 - (e) Posts of auxiliary observers.
4. Concerning the position—
 - (a) The general front and limits.
 - (b) The battalion station.
 - (c) If desirable or necessary, the general location of each battery station.
 - (d) Communication between batteries and battalion station.
 - (e) Limits of position for each battery.
 - (f) Degree of cover, amount of concealment, or least range required.
 - (g) If desirable or necessary, the general location of the limbers.
 - (h) General location of the battalion combat train.

5. Any special instructions regarding the occupation of the position.

6. When fire shall be opened, whether immediately or when ordered, or whether batteries shall report "Ready to fire."

7. Special precaution for security required of captains, especially those of the flank batteries.

1638. The captains having received their instructions at once proceed to reconnoiter and occupy their positions.

1639. The duties to be assigned the battery reconnaissance officers accompanying the major depend upon the conditions. Some of these duties are: To reconnoiter the enemy's position; to locate and establish communication with friendly troops; to act as agents between the battalion commander and the commanders of the troops supported by the battalion; to reconnoiter positions which the eventualities of the action may render desirable; to act as auxiliary observers.

1640. In the performance of duties ordered by the major each battery reconnaissance officer is assisted, unless otherwise directed, by a scout corporal and a scout private, the latter being used as agent to or signaler with the sergeant major or adjutant. Whenever necessary, reconnaissance officers use their orderlies as agents for carrying information or messages to or from the adjutant.

1641. When, after the occupation of the position, any battery reconnaissance officer is no longer needed by the major, and also when such reconnaissance officer is to be used as an advanced observer of fire, he should be sent to report to his captain.

1642. The battalion sergeant major, assisted by the signal corporal and the signal private, establishes communication with the batteries. He then assists the adjutant or major by taking charge of all the details of sending and receiving messages by

flag or courier. He assists the scouts in sending or receiving flag messages to or from reconnaissance officers, auxiliary observers, agents with friendly troops, etc.

1643. The signal corporal, assisted by the signal private, acts as operator at the battalion station. These two learn from the adjutant what artificial cover is necessary at the battalion station, and, assisted by the agents and the battalion bugler, construct the same at the first opportunity. A caisson may be taken from the combat train for use as cover at the battalion station. When wire communication is established between the higher commander and the major the signal private is the operator at the major's station.

1644. One of the agents remains in an unexposed position within hearing distance of the station. The other agents remain with and give their attention to their horses at the post of the horses belonging to the detail.

1645. In the advance to a position, if reconnaissance to the front is directed, it is conducted under the adjutant by the three battery reconnaissance officers and the seven battalion scouts. The sergeant major assists the adjutant by superintending the details of sending and receiving messages. The adjutant should exercise the greatest care to see that these officers and men, before going out, are suitably mounted and equipped and thoroughly understand their duties. Available maps should be consulted and the territory to be covered should, if practicable, be divided into sectors, an officer and two scouts being assigned to each. Before going out these men should be able to answer the following questions:

1. Where is the enemy or where is he supposed to be?
2. Where are our troops? Are friendly scouts, patrols, or troops likely to be encountered?
3. What information is desired; what is my mission?

4. What features are of especial importance?
5. What general direction is to be followed?
6. Where and to whom are messages and reports to be sent?
7. Are negative reports to be sent in; if so, how often, or from what places?
8. When am I to return, or at what place am I finally to report?

While such reconnaissance is under way, the major, with the adjutant, is well in advance of the battalion, conducting the march.

1646. Following is a summary of duties in the battalion detail:

Battalion Sergeant Major.

1. In general charge of the instruments and equipment used by the detail.
2. Forms and commands the detail.
3. Marks the route for the batteries or for the battery details to follow.
4. Keeps the detail under cover when approaching or in the vicinity of an observing position.
5. Accompanies and assists the adjutant in sending and receiving messages when the detail is reconnoitering to the front.
6. Ascertains from the adjutant or major:
 - (a) The rendezvous point at which to assemble the captains, their details, and the reel cart and instructs a scout or scouts to watch for and guide them to it.
 - (b) The general location of a post suitable for the horses of officers and detail and instructs the battalion bugler to reconnoiter it and properly secure the horses there.
 - (c) The location of the battalion and battery stations and the orders relative to communication between them.

7. Assisted by the signal corporal, removes from the reel cart all necessary instruments; sets up the battalion commander's telescope.

8. Superintends the work of the signal corporal and signal private in establishing communication with the batteries.

9. In general charge of all messages received or sent by flag or agent from the battalion station.

(a) Keeps a chronological record of all important messages received or sent.

(b) Assists the scouts in sending or receiving flag messages to or from reconnaissance officers, auxiliary observers, combat train, etc.

Signal Corporal.

1. Under general supervision of the battalion sergeant major, has charge of and is responsible for all the signal equipment of the battalion; makes such tests and repairs as he may be authorized to make and at the first opportunity reports to the adjutant all trouble which he can not remedy.

2. In charge of the reel cart on the march.

3. Learns from the leading executive when the route is ordered marked and at once takes the reel cart forward at a collected trot to report to the major.

4. Under the direction of the battalion sergeant major, lays the wire and establishes the kind of communication ordered.

5. After the instruments are removed and the wire laid, sees that the reel cart or the unhitched horses are taken to a place of safety and properly cared for by the drivers.

6. Acts as operator at the battalion station, reporting to the adjutant or major when communication with the various batteries is established or broken.

7. Learns from the adjutant or major what artificial cover is required for the station and, assisted by the signal private and the agents, constructs it at the first opportunity.

8. Upon quitting the position, reels up the wire and sees that the instruments are collected and properly packed.

Signal Private.

1. Assists the signal corporal in caring for the reel cart and its accessories.

2. Rides on the reel cart, handling the brake, while paying out or reeling in the wire, and thereafter assists the signal corporal in establishing the communication ordered.

3. Assists in constructing artificial cover for the station.

4. Acts as recorder for the signal corporal.

5. In case of communication by wire with the regimental commander, acts as operator on the regimental wire at the battalion station.

Agents.

1. Until all elements of the command are in position, agents are especially careful, even without instructions, to watch for and render information to the reel cart, captains, officers, men of the various details, and others entitled to it.

2. Under the direction of the major, maintain communication between the various elements of the command.

3. Each agent must:

(a) Keep himself informed as to the location of the elements of the command, so that he can furnish this information to others.

(b) Seek the best routes of approach and study the ground in and around the position, so that he will be able to guide

elements into new positions and to transmit information between the major and neighboring troops.

5. Agents must keep in mind the following:

(a) Before starting with a message, they ask the following questions, if their information is not clear:

1. What is the official designation of the one to whom the message is to be delivered?

2. Where is the person to whom it is to be delivered?

3. What is the best and shortest way there, or can I be given a map of the route?

4. Am I to report back as soon as the message is delivered; if not, to whom shall I report?

(b) Important messages in writing should have their purport understood by the bearer so that, if necessary, they may be destroyed to prevent their falling into the hands of the enemy.

(c) On the envelope containing a written message is written:

1. Name of messenger.

2. Date and hour of departure, as: 22 Feb., 15, 9:40 a. m.

3. Rate of speed.

(d) Agents must understand how to ride at the different rates of speed (360).

(e) If mounted and ordered to deliver a message, and the hour of departure and rate are not indicated, they ask for them.

(f) At all times they keep informed as to the location of their own units.

(g) Note carefully the country traversed.

(h) Move promptly when on an errand. All military persons are required to render assistance in expediting movements of agents.

(i) On reaching destination, call out designation of person sought.

(j) Having delivered message:

(a) Ask if there is any reply.

(b) If receiver forgets to do so, ask that he initial the envelope and record hour and date thereon.

(k) If aware of the nature of the message carried, after delivering it report any circumstances affecting the situation which have arisen since leaving the sender.

(l) Always repeat a verbal message, word for word, in the presence of the sender, making certain they understand the meaning of the message.

(m) After diligent search, if the person to whom the message is sent can not be found, endeavor to find some other person who can take full advantage of the information conveyed. Whether or not this can be done, always report back to the sender with full statement of facts in the case.

(n) Unless otherwise directed, always report back to the sender, whether or not the message was delivered.

(o) When a messenger carries a message unsealed, or not marked "Confidential," he will permit commanders along the route to read it. He sees that they initial the envelope and record the hour and date when they read the contents. When it is desirable that neighboring troops get information from a message sent to a superior, that fact is noted on the envelope, and it is the duty of the messenger to see that they get it. He must see that they initial the envelope and record the hour and date thereon.

Scouts.

1. Act as route markers.

2. Usually operate in pairs, a scout corporal and scout private with each reconnaissance officer.

3. Understand the duties of carrying information as outlined under Agents.

4. Regarding reports, scouts must keep in mind the following:

(a) Word a report like a telegram, brief and clear, but omit nothing that is important.

(b) Write legibly. The person receiving it should have no difficulty in making it out.

(c) Names of persons and places should be in block letters.

(d) Avoid vagueness; be accurate; report facts.

(e) Report hearsay information as such, and state its source.

(f) Always give the reason for surmises.

(g) A report about the enemy should answer the following questions:

1. By whom seen?

2. How many?

3. What arm?

4. Where?

5. What doing?

6. At what time seen?

(h) A report is of no value unless it gives:

1. Designation of sender or sending detachment.

2. Place.

3. Date and hour, as 4 February, 1908, 2:45 p. m.

4. Signature, writer's surname and rank.

(i) When more than one report may be sent by the same scout to the same recipient, reports should be numbered consecutively.

(j) Copies should be kept of important messages or reports.

(k) Remember that "negative" reports are often of great importance. They show "where" the enemy is not; where the scout or patrol is; and that the patrol is still working or is not captured.

(l) Always use compass bearings in reports, never "right" or "left" except with regard to the banks of a river.

(m) Avoid indefinite expressions, such as "in front of," "behind," "on this side," "beyond," etc.

(n) Roads are designated by connecting two or more names of places on the road with dashes, as: Natches Gate-Concrete Ford road.

(o) A message or report should state what the scout or patrol is going to do next.

(p) Use common sense in reporting. Useless reports hamper a commander and waste his time.

(q) In making a verbal report think out beforehand what is to be said; give the report coolly and take care that it is not misunderstood.

Battalion Bugler.

1. At the firing position learns from the sergeant major where the horses belonging to the detail will be posted, reconnoiters the place, and directs all orderlies and horseholders to that point.

2. Is in charge of the horses and sees that they are properly linked or otherwise secured and watched; takes or sends any horse called for from or to the battalion station.

3. Takes post near and assists the battalion sergeant major when not otherwise engaged.

Major's Orderly.

1. Acts as horseholder for the battalion commander.

2. When not being used by the battalion commander, watches or assists in holding horses belonging to any member of the detail.

Adjutant's Orderly.

1. Acts as horseholder for the adjutant.
2. When not being used by the adjutant, watches or assists in holding horses belonging to any member of the detail.

CHAPTER VII.—ADVANCE TO AND OCCUPATION OF THE POSITION.**SECTION I.—THE FIRING BATTERIES.**

1647. When the major and captains ride forward on reconnaissance the executive of the leading battery of each battalion regulates the march of the battalion in accordance with the orders which he receives.

1648. Ordinarily battery commanders, after completing their preliminary reconnaissance and arrangements for opening fire, will remain in observation of the terrain and targets assigned to them. If necessary, however, they may meet their batteries a short distance in rear of the position and personally conduct them into the position selected. This necessity must frequently arise in the occupation of a position for direct laying.

1649. Battery commanders usually send their first sergeants to act as guides and to transmit instructions to the executive in the occupation of the firing position (**1608**). In joining their executives each first sergeant rides over the route to be followed by his battery during the immediate approach to the position. Any information thus gained is transmitted to the executive in addition to the instructions of the captain.

1650. Every effort is made to complete the reconnaissance so that the first sergeants may rejoin their batteries in ample time to avoid any interruption of the advance of the batteries. If this is not practicable and the batteries must be halted every

precaution must be taken that they make the utmost use of available cover (1626).

1651. Upon the arrival of the first sergeant each executive at once proceeds to carry out the instructions of his captain, taking care not to interfere with the movements of other batteries.

1652. If not inconsistent with the requirements of the tactical situation, concealment from the enemy's view is always to be sought during the approach to and occupation of the position. The possibility of action by surprise is thus secured.

Reconnoitering parties, scouts, and other members of the headquarters detachment must operate so as to avoid indicating the position which is to be occupied. If exposure is necessary, it should not occur in the neighborhood of the chosen position.

The necessity must be borne in mind of remaining concealed not only from ground occupied by the troops to be attacked but also from ground on which hostile observing stations may be located.

To avoid raising dust, movements in the neighborhood of a masked position should habitually be made at a walk. If exposure in the route of approach is unavoidable, such place should be passed at a rapid gait, and, if necessary, by the successive movements of carriages.

1653. Movements of the guns by hand are often unavoidable, but every effort is to be made to reduce this labor. By proper reconnaissance the exact positions which the guns are to occupy may be determined. These should then be drawn by the horses as close to the positions as the circumstances warrant.

1654. A definite decision must be made as to the extent to which a masked occupation of the position is permissible or possible. If the occupation of the position will be at all visible to the enemy, delay in getting the horses away from the battery

and in establishing the guns and caissons in position may be fatal. It is preferable in such cases to require the horses to draw the guns boldly to positions from which they can immediately open fire, without any manhandling whatever. Careful preliminary training permits this to be done promptly, without confusion, and with minimum exposure of personnel and animals.

When the circumstances warrant it, however, it is always preferable to unlimber under cover. If direct laying is to be employed, the guns are run up by hand, after unlimbering, until each gunner can just see his target through the sights. By approaching the position from the flank in double-section column the guns may be drawn most nearly to the positions which they are to occupy, while still keeping the horses concealed from view. Causing the drivers and cannoneers to dismount still further promotes close approach and concealment from view. The drivers should not be dismounted, however, if the battery is likely to come under fire. By requiring all individuals to keep under cover and by avoiding all movements on the crest, a position may readily be occupied without the knowledge of the enemy.

1655. Before the arrival of his guns, each battery commander should have determined exactly where they should be posted so that their front will be approximately normal to the proposed line of fire, and so that each gunner will surely be able to see the target or aiming point, as the case may be (**1605-1607**).

1656. The approach to and occupation of positions under cover of darkness is of frequent occurrence. In such cases the route and all the details of the movement must be determined in advance by reconnaissance during the day. It is usually

desirable to post markers along the route to be followed before nightfall. Such markers must be at close intervals.

1657. Immediately upon establishing the guns the executive takes steps to guard the communications with the battery station. As soon as possible after occupying the position he begins the preparation of artificial cover from both fire and observation (**1574**). When the communication with the battery commander is other than by voice, he is also responsible for posting observers and taking other measures for providing security against close attack.

Although these duties are habitually incumbent upon the executive, the captain is not relieved from the duty of foreseeing and giving such special instructions as the conditions require.

1658. As soon as the carriages have been unlimbered each first sergeant conducts the limbers of his firing battery to the position designated for them and forms them to facilitate prompt movement and to take advantage of available cover (**1556**). He maintains strict order and discipline among the limbers at all times. If dismounted no driver is allowed to leave the heads of his horses unless he is replaced.

The limbers being posted, the first sergeant stations a man to watch for and transmit signals from the executive.

If the horses are heated and the atmosphere is chilly, the health of the animals may be endangered by letting them stand. Under such circumstances, and when the position of the limbers will not be exposed thereby, the first sergeant puts them in a quadrangle or circle and walks the horses until normal temperature and respiration have been restored. If the weather be severe the same method is adopted to keep drivers and horses from suffering with the cold.

SECTION II.—BATTALION AND BATTERY COMBAT TRAINS.

1659. The position for the group of combat trains can ordinarily be selected and the agent dispatched (**1636**) in ample time to guide the train to its position.

1660. Upon reaching the position the commander of the group posts it to facilitate movement and to utilize the available cover (**1557**). Ordinarily the carriages are posted with sufficient intervals to permit the free passage of vehicles which may be brought up.

1661. Having posted his train the group commander sends the agent who has guided him to the position to report to the major. He then informs himself as to the position of the distributing station and assures himself that communication and the supply of ammunition to his group are maintained.

1662. If on approaching the position of the firing batteries the group commander has not received instructions as to the position he is to take, he halts his train under cover, reconnoiters and selects a position. Having posted his train he immediately takes steps to establish communication with his battalion and battery commanders and with the ammunition train.

1663. During the action the group commander orders such movements of the combat trains as his instructions and the developments of the action may from time to time require; he uses every means in his power to ensure the uninterrupted supply of ammunition from the combat trains to the batteries on the one hand, from the ammunition train to the combat trains on the other.

1664. Each firing battery is, as a rule, furnished with ammunition directly from its own combat train, the chief mechanic transmitting the orders of his executive or battery commander as to the amount required and the manner in which it is to be

transferred. The combat train commander makes such transfers of ammunition within his group and takes such other steps as will insure his ability to supply the demand from any battery.

Except in emergencies, requests from other battalions for ammunition are honored only on the order of higher authority.

1665. The group commander keeps the battalion commander constantly informed as to the state of his ammunition supply.

1666. When a battery acts independently the battery combat train is handled in conformity with the general principles enunciated for the group. In such cases the chief mechanic joins the battery commander as soon as the battery is subdivided for action. The chief mechanic performs the duties of reconnaissance and guiding the battery combat train to its position prescribed in the case of the agent of the group. The train having been established, the chief mechanic reports to the executive as before.

CHAPTER VIII.—CHANGES OF POSITION.

1667. If the conditions permit, it is most important to post Artillery at the outset in positions from which it can act effectively throughout the various phases of the engagement. This consideration should be kept in mind in forming the plan of action and in utilizing the available ground.

If guns are rendering effective service, changes of position in the midst of an engagement should be made only when some very distinct advantage will thereby be gained. Changes involve interruption of fire, necessitate dismantling and reestablishing communication, a fresh orientation of the command and a new adjustment, and, if made in the view of a vigorous enemy, are apt to result in paralyzing losses in men and animals. A reduction of the range is not in itself ordinarily sufficient to

warrant such a change, provided the guns are doing effective work and their continuous action is important.

1668. Nevertheless, as an action develops changes of position may be essential, whether to secure a more desirable position to the front or flank, or to reach positions for covering a movement in the rear. Artillery commanders must anticipate and prepare for such movements. Reconnaissance officers and scouts must be employed to reconnoiter and select routes, to remove obstacles, to perform such pioneer work as may be needed, and to prepare themselves to guide organizations over the routes selected.

1669. Officers commanding batteries, battalions, and the higher units of Artillery habitually precede their organizations to the new position for purposes of reconnaissance as soon as the conditions of the case admit. If the movement is made under fire, however, it may be best for battery commanders to remain with their batteries, sending a lieutenant with the battery detail for reconnaissance. When the batteries of the battalion are acting together the major decides whether or not the captains are to remain with their batteries during a change of position.

When a retreat is in question the Artillery commander must decide whether it is more important for him to conduct the withdrawal of the rearmost batteries or personally to select new positions from which to cover the retreat. If the Artillery commander does not remain with the rearmost batteries, he must definitely assign the duty of determining how long they are to remain in action to the senior officer with them. When the commander remains with the rearmost batteries a senior Artillery officer should be designated to reconnoiter and give orders as to the occupation of positions to the rear.

1670. Changes of position are always made under cover if practicable, the importance of occupying the new position without the enemy's knowledge and of opening upon him by surprise being always kept in mind.

1671. In many cases the change of position can be made only at night. In such cases the movement must ordinarily be made without lights, in the utmost quiet, and every precaution must be taken to avoid losing the route. Scouts must be sent out in the daytime to go over the ground and pick out the best route to the new position. In difficult cases, as, for example, in movements over country where roads are not available, it is advisable to select landmarks or stations along the selected route and move cautiously from one to the other. Markers at close intervals are posted before dark and left in position until the head of the column passes.

1672. If a hasty movement is imperatively demanded, great losses may be avoided by skillfully using the cover afforded by the ground and by moving rapidly over spaces where exposure is inevitable. If the guns are under effective fire of the enemy's Infantry or Artillery, a change of position should not be attempted, as it is impracticable to bring up the horses for limbering; in such cases a lull in the action must be utilized for moving the guns to a position in which they can be limbered under cover. If a repulse is imminent and the guns are being threatened by the enemy's advancing troops, then the opportunity for withdrawing must be gained by beating back the enemy and securing at least temporary immunity from his fire. It is useless to bring up the horses under close and effective hostile fire. On the other hand, Artillery, as long as it has ammunition, should be able thoroughly to protect its own front. At the last, officers and men should take shelter among the

carriages and with their pistols force the enemy to pay the dearest price for the possession of the guns.

1673. Changes of position of the larger bodies of Artillery are usually made by echelon, a portion of the force being thus always in position to cover the movement of the remainder. A single battery, however, is not ordinarily echeloned for a change of position; but when a movement has to be made across a fire-swept zone, it may be necessary to move by single carriages.

1674. The formation to be adopted for a change of position must be extremely flexible, so that the march may be most readily adapted to the lay of the ground and so that changes of formation will be necessitated as little as possible by obstacles which may be met. For individual batteries, flank column or double-section column is ordinarily to be recommended. The larger units should endeavor to move on as large a front as possible and with wide intervals; if they must move in column, then the distances should be considerably increased.

1675. The gaits to be employed in a change of position are determined entirely by the conditions of the case. When a movement has to be begun in the midst of great excitement, however, it is habitually commenced at a walk, so as to steady the command and avoid the possibility of confusion.

1676. A change of position by certain batteries may be necessitated by the fact that the enemy has succeeded in locating them and in securing the ascendancy of fire. A short movement by hand during a lull in the fire may be sufficient in such cases.

1677. It is the province of the commander of the troops to order changes of position of Artillery. When emergencies arise, however, which do not admit of reference to higher authority, the Artillery commander on the spot must act promptly and decisively, moving the guns if necessary so as to be able to

deliver the fire which will best meet the new situation which has arisen. His action should be at once reported to the next higher authority. It is of the utmost importance, however, that the plans of the higher commander should be well known to his subordinates, so that they may exercise intelligent initiative in conformity with those plans.

1678. When an important change of position is imminent it is especially important that the ammunition chests of the firing battery be fully replenished, in readiness for the movement.

A battery which has expended all its ammunition does not for that reason retire; it secures a fresh supply. While awaiting replenishment it shelters the unemployed personnel.

A disabled gun is not sent to the rear during the action; if it can not be repaired on the firing line, it is left there.

Batteries are not relieved, but are supported by fresh batteries.

*Batteries will not retire, even in the face of imminent danger, without orders. The loss of well-served guns in the defense of a position or in close support of the other arms is honorable.

CHAPTER IX.—COMBAT.

SECTION I.—WITH THE ADVANCE GUARD.

1679. The action of Field Artillery with an advance guard will vary with the mission. It should not occupy positions from which it can not be withdrawn without a general engagement, perhaps not intended by the commander of the force. Its main duties are to break down any resistance to the advance of the other arms or to cover their retirement if necessary.

Positions with as much cover as possible should be chosen, with preservation of complete freedom of maneuver, while the

guns themselves should be placed at wide intervals and used with great rapidity of fire, so as to deceive the enemy, if possible, as to the strength of the force opposed to him.

SECTION II.—THE ATTACK.

1680. In general, when large forces are engaged, the attack presents three principal phases:

1. The preparation.
2. The decisive action.
3. Securing the victory, or averting disaster in case of failure.

The use of Artillery in the attack will vary in conformity with these different phases.

1681. In the preparatory stage Artillery has for its objectives those parts of the enemy's force which at the time most oppose the action of our Infantry. Until our Infantry comes within effective small-arms fire the principal target will, therefore, be the hostile Artillery. As the progressive advance of our Infantry brings them within effective rifle fire, more attention must be paid to the hostile Infantry.

Obstacles, such as walls and abatis, which impede the advance of our Infantry should, if possible, be destroyed by Artillery fire.

1682. The counter batteries acting from masked positions must dominate the enemy's Artillery with the greatest possible rapidity; the Infantry or breaching batteries frequently taking, on account of their more varied rôle, a less deflade than the counter batteries, open upon the hostile Infantry and obstacles. The designation of batteries as counter or Infantry batteries is not permanent and may vary with the progress of the engagement.

1683. The Artillery preparation for the Infantry attack is, in general, carried on simultaneously with the Infantry advance.

If, however, the enemy has fully occupied his position, or the attack is able to form under cover close to the hostile position, and thus has only a short distance to advance, the preparation may take place both before and during the attack.

1684. Before opening fire with any unit of Artillery on any objective, care must be taken to have at hand another unit ready to open upon any of the enemy's Artillery which may attempt to prevent the first unit from accomplishing its mission by forcing it to cease firing.

In order to have batteries available for this counter attack economy of forces must be practiced; no greater force must be used at first than is absolutely necessary.

1685. In the decisive attack a special preparation is necessary. The most rapid and intense concentration of fire of all the available Artillery is brought to bear upon the objective against which the Infantry is to advance.

During this special preparation the counter batteries continue or resume their fire on the hostile Artillery.

Some of the Infantry batteries may be sent forward to closer positions as the attack progresses, but it is to be remembered that during such changes of positions the fire of these batteries is lost to the assailant at a most critical time, and such movements should be avoided if possible. The range and ease of manipulation of the fire of Field Artillery enables it to dispense with maneuvers which, in the last analysis, are prejudicial to the Infantry which it is charged with supporting.

1686. As our attacking Infantry reaches the danger zone of our Artillery the commander of the Infantry firing line should, by a preconcerted signal—such as the display at the firing line of a conspicuous and suitable flag—inform the Artillery commander of the fact. The Artillery then increases its range so as

to impede the movement forward of possible hostile reserves, and to take the enemy in rear in case he retreats.

1687. When the third phase of the attack is reached, accompanying batteries will be designated from the Infantry batteries, whose mission will be to reach the captured position as soon as possible after the Infantry, in order to pursue with their fire the retreating enemy and to aid in repulsing any offensive return. They should cover with their fire the advance of troops which may be pushing on in pursuit, and break down all efforts of the enemy to re-form and renew the fight.

1688. In case of reverse, Artillery directs upon the enemy's attacking troops every gun which can be brought to bear, in order to destroy their morale and to assist the repulsed troops in the renewed effort which may lead to victory. If the repulsed troops continue to be forced back, the Artillery must cover their withdrawal, resisting the advance of the enemy, if necessary, until annihilated.

SECTION III.—THE DEFENSE.

1689. The defense requires, before all things, skillful utilization of the available ground in order to develop fire effect to the utmost.

Exhaustive preliminary reconnaissance of the position, improvement of communications within it, determination of the ranges, especially of those to probable Artillery positions of the enemy and to points in the probable direction of the Infantry attack, are advantages which the defense must utilize so far as time permits.

1690. In most cases it will be advisable for the Artillery to be held in readiness at first, even if the position has been artificially strengthened. For this alone will insure the Artillery

meeting the direction of the attack with a correct front and will prevent it being forced to premature changes of position. This also affords the best means of preventing the enemy from gaining an insight into our own dispositions and intentions before the action has commenced.

In preparing positions which may be occupied, a most extensive use is to be made of earth cover. If time permits, it is advisable to provide masks and to improve the field of fire by cutting down hedges and trees. It is of the greatest importance to place a large supply of ammunition in readiness in the immediate vicinity of the guns.

As soon as the general direction of the enemy's attack is recognized, but if possible before the enemy brings his batteries into action, the fighting position is occupied. Sometimes flanking Artillery fire can be employed with advantage to search dead angles before the fighting position.

1691. The commander of the troops will usually order the opening of fire. Firing at excessive ranges and upon small hostile detachments is to be avoided, for this assists the enemy in locating the guns.

1692. As a rule, the action will be commenced by engaging the assailant's Artillery, and, as a rule, the whole of the defender's Artillery will be employed if necessary to attain superiority.

The commander of the forces gives the general instructions for resisting the Infantry attack.

When the enemy's Infantry advances to the attack, the Artillery must make them their target, regardless of the enemy's Artillery fire, if necessary leaving cover for this purpose. If possible, the enemy's batteries should at the same time be held in check, but the repulse of the Infantry attack must remain the most important feature.

If, even before the Infantry attack commences, the enemy's Artillery proves itself so superior that it appears hopeless to continue the Artillery action, the batteries may temporarily seek cover from the enemy's fire. But as soon as the enemy institutes the decisive attack every gun must at once, even without particular orders, resume the struggle and engage the enemy's Infantry only, heedless of the Artillery fire. A few batteries, even single ones, thrown into the struggle at unexpected points may be of especial use at this juncture.

1693. If, nevertheless, the attack succeeds, part of the Artillery must prevent the advance of hostile batteries into the captured position, part must concentrate its fire upon the hostile Infantry which has penetrated, and, in cooperation with the reserves, expel the enemy from the captured position. This is one of the tactical situations in which steadfast endurance to the last is imperative. Even if it lead to the loss of the guns, this is in the highest degree honorable.

SECTION IV.—WITH THE REAR GUARD.

1694. As the principal duty of a rear guard is to gain time, and as it should be able to withdraw without serious loss, it should be strong in Field Artillery. Positions should be selected so as to utilize the long range of the guns to force the enemy to deploy at the greatest possible distance; such positions must also afford sufficient facilities for withdrawing. In withdrawing, small changes of position should be avoided, the retirements from one position to another being over as great a distance as is consistent with delaying the enemy to the utmost.

SECTION V.—HORSE ARTILLERY WITH CAVALRY.

1695. In an advance, Horse Artillery should march united and well toward the head of the main body of the Cavalry

command. Ordinarily no Artillery is attached to the advance guard.

1696. In large commands there may be time for the regular issuance of orders for combat by the Cavalry commander, but frequently in large commands and very often in small commands there will be no time for consultation and the Artillery commander will receive only very brief and general instructions, if any at all. Therefore it is imperative that the Field Artillery commander be with the Cavalry commander when combat is imminent, so that he may receive his orders directly, if any are to be given, or that he may get the decision and grasp the plan of action by hearing the orders for the subordinate Cavalry commanders.

1697. The Horse Artillery commander must not only have great quickness, decision, and tactical instinct for successful cooperation, but he must be constantly in touch with the situation, must be constantly aware of the definite location of his units, must have them well in hand and so disposed as to meet all possible emergencies, and must have sure and rapid means of communication with them.

1698. For this reason when combat is imminent battery commanders and their details should be at the head of the leading battery of their battalion, if not further forward in the march column.

In such cases, as the Cavalry and Artillery commanders will usually be with the advance guard, the battery commanders and their details may be brought forward and march at the rear of the advance guard.

1699. Rapidity and correctness of decision on the part of Field Artillery commanders, accuracy and rapidity of fire on the part of the enlisted personnel and mobility as regards the guns are essential to Horse Artillery success.

1700. When Cavalry meets Cavalry and a mounted action is imminent the friendly Cavalry will make a rapid deployment, generally either to the front or to one of its flanks.

In the absence of any orders, the Artillery commander must make a quick decision as to the position to be taken up by the Artillery and his command must be moved thereto with the utmost rapidity.

A position on one or both flanks of the attacking line is generally best; a position in rear of the Cavalry attacking line is generally faulty, as the advance of the friendly troops masks the guns too soon.

In such an action any attempt at dispersion of the Horse Artillery into units less than a battalion is usually also faulty, for several reasons: (a) Time is lacking for the necessary reconnaissance and issue of orders; the limited time usually demands a simple plan; (b) time is lacking for the concentration of fire upon the most important target; (c) with the batteries dispersed, one or more batteries are almost certain to have their fire masked too soon by the friendly Cavalry.

The following general rules should govern the Horse Artillery commanders in their choice of position and conduct of the action:

(a) The position for the guns should be chosen with a view of obtaining the most effective fire on the enemy's Cavalry previous to the Cavalry charge and to covering with effective fire the area over which our charge is to be made.

(b) The position chosen should permit the fire of the guns to be delivered up to the moment of collision, and should not hamper in any way the movement of our Cavalry.

(c) Long-range firing at the enemy's guns is to be avoided.

(d) While the opposing Cavalry is the most important target, if the enemy's Artillery is inflicting losses on our Cavalry, it

will be necessary to assign batteries to hold them in check. When the fire of our guns becomes masked by the movement of our Cavalry, they may all be turned upon the enemy's Artillery.

(c) If the charge succeeds, the Artillery should advance as soon as possible; if it fails, the guns should form a rallying point for the Cavalry, which should invariably rally in rear of a flank and not fall back directly on the guns.

(f) In the mounted combat and in the pursuit by Horse Artillery, indirect laying has no place.

1701. In supporting Cavalry acting dismounted, the same principles govern as herein laid down for Artillery in the field generally. The extent of front covered leads to a wide dispersion of Horse Artillery units. Their rôle demands that their action should be characterized by promptness and a readiness to take the initiative. Indirect laying may be used, provided it causes no loss of time.

1702. A particular and frequent phase of action with Cavalry dismounted is an advance for the seizure of an important position.

In this case as quickly as the Cavalry advance guard has gained the position, the batteries should push rapidly forward at a rapid gait and establish themselves for its defense.

The Artillery reconnaissance details with the Cavalry advance guard should be sufficiently numerous to cause no delay in the selection of positions and in guiding the batteries thereto.

CHAPTER X.—AMMUNITION SUPPLY.

1703. The organization and operation of the divisional ammunition service is the duty of the Field Artillery. Artillery officers must, therefore, understand the principles governing the supply of small-arms ammunition as well as of Artillery ammu-

munition and must study the dispositions suitable for the supply of the different arms in action. The principles are set forth in Field Service Regulations. Sound judgment in making suitable dispositions is to be acquired through the study of that part of the regulations of the several arms relating to combat and through the solution of tactical problems involving ammunition supply.

1704. The conditions of modern war demand very great expenditures of ammunition. While such expenditures must unhesitatingly be made when necessary, it is the duty of commanders of all grades to see that due economy is exercised and to make provision for timely replenishment of ammunition.

No means should be neglected for bringing up ammunition to troops in action and for keeping up the fire, on the maintenance of which the success of the combat may depend.

1705. The supply of ammunition is effected from the rear to the front. It is the duty of the commander of each unit in the ammunition supply system to ascertain the position of each of the units which he is to supply and to establish contact with such units. Troops engaged in battle must be kept free from all anxiety as to the ammunition supply.

1706. The commander of the line of communications is responsible for the service of ammunition from the base to include its delivery to the ammunition trains.

The commander of divisional trains is responsible for the conduct of the ammunition train until it is released from his control.

The commander of the ammunition train is subordinate to the commander of trains until his train is released from the control of the latter.

1707. Base ammunition depots are supplied from arsenals.

Advance depots are supplied from base depots.

Ammunition columns are replenished from the advance depots.

Ammunition trains are replenished from the ammunition columns of the line of communications. In exceptional cases where the rail or water heads of the line of communications are sufficiently near the ammunition trains may be replenished directly from the advance depots.

Combat trains are replenished from the divisional ammunition trains.

The caissons of the firing battery are replenished from or replaced by caissons of the combat train.

Within the firing battery ammunition is replenished as described in paragraphs **1033** to **1038**.

1708. An ammunition-distributing station is the place to which combat trains are sent for resupply.

An ammunition refilling point is the place where the ammunition train is refilled.

An ammunition rendezvous point is the place to which ammunition columns of the line of communications are dispatched and where they are met by agents of ammunition trains and conducted to refilling points.

1709. Combat and ammunition trains are organized as provided in Tables of Organization.

1710. The commander of the ammunition train is the immediate subordinate of the divisional Artillery commander, after the ammunition train has been released from the control of the commander of the trains.

1711. It is the function of the commander of a unit to which a combat train is assigned to regulate the supply of ammunition from the combat train to the guns and to send the empty caissons of the combat train to the distributing station.

Empty caissons of the firing battery may often be sent directly to a distributing station.

1712. The ammunition train, as a rule, marches in rear of the main body. At the beginning of an engagement the sections of the train are directed to proceed to stations from which practicable routes radiate to the combat trains. Usually the most suitable preliminary locations will be found at a distance of from 2 to 3 miles in rear of the line of battle. Inasmuch as the expenditure of ammunition will not be the same for all parts of the line, it is, as a rule, desirable to hold the sections together during the earlier stages of the engagement. As the probable course of the engagement becomes known it may be advisable to subdivide the sections and to station the subdivisions at such places as will facilitate the resupply of the combat trains.

1713. A position selected as distributing station should afford free access from all directions and ample space for posting the carriages so as to leave room for a third carriage to be driven between any two adjacent carriages, and should be so located as not to interfere with the movements of other troops or trains.

All routes leading from a distributing station must be reconnoitered and arrangements made for probable movements.

1714. The position of combat trains is discussed in paragraphs 1542 to 1545 and 1659 to 1666.

1715. The commander of the ammunition train furnishes an agent to connect the Field Artillery commander's headquarters with the train.

Similarly the commander of a section furnishes an agent to connect with the combat train or with the headquarters of the unit which the section is to supply.

1716. The positions of an ammunition train and of its sections, when detached from it, are marked by a red flag during the day and by a red lantern at night.

1717. The ammunition on hand for 3-inch field guns, including that carried in the ammunition train, is 464 rounds per gun, distributed as follows:

	Rounds.
With the firing battery-----	190
With the combat trains-----	168
With the ammunition train-----	106
Total-----	464

1718. The limbers of Horse Artillery operating with Cavalry may or may not be filled, depending on the nature of the operations, in the discretion of the Horse Artillery commander. The ammunition train of a Cavalry division transports 53 rounds per gun.

CHAPTER XI.—FIELD ARTILLERY SUPPORTS.

1719. The security of Field Artillery on the march or in combat must be provided for either by the distribution of the other arms or by bodies of Infantry or Cavalry, called Artillery supports, specifically detailed for the purpose. When such is not the case the necessary protection must be furnished by the nearest unit whose mission will permit.

1720. The Artillery commander takes general measures to insure the support of the Field Artillery. Subordinate commanders, by the suitable disposition of Artillery scouts, supplement his arrangements or, if security is not provided by the other arms, provide for early warning against surprise or attack.

1721. When operating with Infantry the detail of a support is not necessary except when the Artillery is separated from the main body or occupies a position in which its flanks are exposed. The detail of a special support is to be avoided whenever possible.

1722. When operating with Cavalry, especially against Cavalry, the detail of a support will be almost habitual for the following reasons: (a) In dismounted actions the dispersion is generally great, and hostile Cavalry may penetrate the intervals; (b) in mounted action, the Artillery is most frequently compelled to take up a flank position and is thus exposed to a flank attack; (c) the phases of mounted combat change so rapidly that Field Artillery amply protected by the distribution of troops at one moment may be seriously exposed the next.

1723. On the march, if there is danger to the flanks from bodies of the enemy, the Artillery may be broken into columns not longer than a regiment; it then marches like a convoy with Infantry or Cavalry in front, in or opposite the center and at the rear. On marches through long defiles, or dense forests, or at night, it may be advisable to place the Artillery near the rear of the column.

The country must be thoroughly reconnoitered by patrols within long rifle range.

1724. In action the formation and location of the support must be such as to gain and give timely information of the enemy's approach and to offer actual resistance to the enemy beyond effective rifle range of the Artillery's flank. It should not be close enough to the Artillery to suffer from fire directed at the Artillery. In most cases a position somewhat to the flank and rear best fulfills these conditions.

1725. A support commander is charged only with safeguarding the Artillery. The tactical employment of each arm rests with its commander. The two should cooperate through conferences by which the plans and orders of each are mutually understood.

1726. Since the support is auxiliary to the Field Artillery, it should conform to its movements. The decision to change position rests with the Artillery commander.

1727. Infantry supports should not be mounted on the carriages or off horses except under the most unusual circumstances.

CHAPTER XII.—TRANSPORTATION BY RAIL AND WATER.

SECTION 1.—BY RAIL.

1728. The arrangement for transportation of troops by commercial railways is a function of the Quartermaster Corps.

To enable the quartermaster properly to estimate for cars he should be informed as to the exact number of men and animals and the amount of matériel and equipment to be transported for each separate battery and headquarters. Except in theaters of actual operations the quartermaster must also be given such itemized lists of property and weights as will enable him to prepare bills of lading. To assist the quartermaster each battery commander and each headquarters should furnish a list of the numbers and kinds of cars required for the unit.

1729. Whenever practicable sleeping cars are provided for the personnel on journeys of 24 hours or greater duration. Sufficient cars are furnished to provide a section for each three men and for each two officers. In determining the number of cars allowance must be made for employees of the sleeping car company and of the railroad. These employees include a porter for each car, two cooks for each tourist kitchen car, a sleeping car conductor, and a railroad agent. Each of these employees utilizes one berth.

1780. Tourists sleepers usually contain 14 or 16 sections and tourist kitchen cars 12 sections. A standard sleeper has 13 or 14 sections, including the drawing-room and stateroom.

For the transportation of 5 officers and from 130 to 150 men 3 tourist sleepers and 1 tourist kitchen car are required. For the transportation of 5 officers and from 150 to 195 men 4 tourist sleepers and 1 tourist kitchen car are required. These figures allow for space for the railway employees.

1781. When day coaches must be utilized and the journey is considerable a seat should be provided for each man. On this basis a standard day coach will carry about 30 men.

1782. When kitchen tourist cars can not be provided and meals are to be prepared en route, a baggage car for each train should be furnished for use as a kitchen.

1783. The carriages are transported on flat or gondola cars or occasionally in automobile cars. Flat cars are more convenient to load and unload, especially when permanent facilities are not available.

A flat car of ordinary length—about 36 feet—will carry three Artillery vehicles complete while leaving enough free space to facilitate loading and unloading. For a battery on a war footing six flat cars are thus necessary for the matériel. If the battery is on a peace footing or if the cars secured are 40 feet or more in length, five cars will suffice.

1784. Field wagons are transported on flat cars, three wagons to the car.

1785. Harness, kitchen supplies, officers' baggage, and such of the personal equipment of the men as are not necessary on the journey are carried in a baggage car provided for the purpose.

1786. Box cars are provided for forage, ammunition, and other property according to the necessities. Unless the batteries

are to detrain in the theater of operation ammunition should be boxed and carried in a special car.

1737. Box cars are usually at least 36 feet in length. The interior cross section is about 8 by 8 feet. The load capacity varies from 40,000 to 100,000 pounds. It is inadvisable, however, to load a car to its capacity, and 40,000 pounds may be assumed as the load and 1,800 to 2,000 cubic feet as the cubical capacity of the average box car.

1738. The weight limits the amount of ammunition and of grain which can be carried in a single box car. Cubical capacity limits the amount of military stores of other kinds, especially hay.

Twelve hundred pounds, or 100 rations, of oats occupy a space of about 40 cubic feet. Fourteen hundred pounds, or 100 rations, of baled hay occupy a space of about 120 cubic feet. When access must be had to forage during the journey, 1,200 rations is a suitable load for a forage car.

1739. Animals are carried in stock cars or palace stock cars. If palace stock cars are not available, a box or stock car should be provided for each six privately owned officer's mounts.

The capacity of both the ordinary and the palace stock car averages about 18 Artillery horses per car. The ordinary stock car will carry about 20 mules.

1740. The amount of baggage, forage, and rations to be taken depends upon circumstances, and should be definitely prescribed in the order directing the movement. Ordinarily rations and forage sufficient for three days after the completion of the journey is ample. More than this is generally unnecessary and causes delay and congestion in entraining and detraining.

1741. When movement from garrison or semipermanent camps is contemplated ample notice should be given, if possible, so that the necessary arrangements concerning property not

pertaining to the field equipment may be made. Not less than 48 hours should be allowed for the orderly transaction of this business.

When sufficient time is not available for these purposes the security and care of such property as is left behind devolves upon the troops remaining in the garrison or camp.

1742. The time required for loading each train carrying Field Artillery troops depends upon the facilities for loading and especially upon the amount of equipment and supplies to be carried.

With only the equipment and supplies prescribed for organizations on the march in the field, when all ammunition is carried in the chests and when the facilities for loading are reasonably good a battery should be able to load within two hours from the time when the cars are prepared and all personnel, matériel, and equipment pertaining to the battery has arrived at the loading platforms.

1743. Delays and confusion in loading are chiefly due to lack of advance preparation of a definite and rational plan or to failure to follow such a plan during the loading. A common mistake is the attempt to rush the loading by assigning cars so as to begin the loading of all batteries simultaneously without adequate facilities or cars therefor. In general, confusion will be eliminated and time will be saved by making up each train complete before spotting it at the loading places. For the storage of cars and the making-up of trains ample switching facilities should be set aside. It is especially important that the loading platforms for any one battery be not widely separated. The number of trains which can be loaded simultaneously thus depends upon the available switching facilities. In general, the facilities available in leaving the ordinary garrison or in quitting a concentration camp by a single railroad limit

the cars that can be placed to those necessary for a single battery. As, under a suitable plan, similar cars for the several batteries are loaded from the same platforms, the heavier stores for each organization may be transported to the loading platforms before the departure of the preceding organization. Care must be taken to avoid interfering with the loading and to keep the stores to be loaded on any one train separate from those going on another.

1744. Sufficient tags should be kept on hand to mark all equipment not carried in the cars with the men or not otherwise readily identified. The loading of each class of property should be under the immediate charge of an officer, who should list all items going into each separate car, noting on each list the markings and number of the car.

1745. When a regiment moves by rail it is usually desirable to transport regimental headquarters, the headquarters company, the supply company, and one battalion headquarters on one train.

When a battalion moves alone the battalion headquarters may be attached for transportation to one of the batteries. In this case or when otherwise desirable the attached section of the supply company may be divided among the batteries.

1746. The sequence in which the various organizations move depends largely on the conditions under which the movement is made. In general, a regimental commander with his headquarters company, one of the battalion headquarters, and the supply company should move on the first train. One of the battalion headquarters should be on the last train to leave. This sequence leaves a field officer to superintend the loading of all trains, while the regimental commander with his staff has time to make the numerous arrangements necessary for the detraining and care of the various organizations upon their arrival.

The sanitary personnel should be divided among the trains. If this is impracticable, all of it should be with the last train.

1747. Whenever practicable each battery occupies one train with all of its personnel, animals, and matériel complète. It is however, preferable to have trains of moderate size with good speed rather than long trains with low speed. Each battery train must therefore be loaded so that it may be readily divided into two parts (1752).

1748. When palace stock cars can not be obtained, additional box cars for privately owned mounts at the rate of one car to six horses should be provided. When this is done the number of stock cars may be reduced by one. When tourist kitchen cars are not obtainable the number of baggage cars and of sleepers must each be increased by one.

1749. When the command is on a war footing, the cars required for the regimental headquarters, the headquarters company, the supply company, and one battalion headquarters are as follows:

Flat cars-----	8
Box cars for stores, harness, etc-----	2
Box car for forage-----	1
Stock cars-----	10
Baggage car, or box car with end doors-----	1
Tourist kitchen car-----	1
Sleeping cars-----	3
Total cars-----	26

1750. The cars required to move a light battery on a peace footing are, in the sequence in which the train is arranged, as follows:

Flat cars-----	5.
Box car for ammunition-----	1

Box car for stores, harness, etc.....	1
Box car for forage.....	1
Stock cars.....	7
Baggage Car, or box car with end doors.....	1
Tourist kitchen car.....	1
Sleeping cars.....	3
Total cars.....	20

If no boxed ammunition is to be transported, the number of box cars may be reduced by one. If no stores other than those which are carried on the march are to accompany the battery, the number of box cars may be further reduced. The number of stock cars is sufficient to provide a separate car for privately owned mounts.

If tourist kitchen cars are not obtainable, the number of baggage cars and of sleepers must each be increased by one.

When the extra caissons for a war footing are to be taken, six flat cars are necessary unless exceptionally long cars are available.

1751. When the light battery is on a war footing the cars required are:

Flat cars.....	6
Box car for ammunition.....	1
Box car for stores, harness, etc.....	1
Box car for forage.....	1
Stock cars.....	9
Baggage car, or box car with end doors.....	1
Tourist kitchen car.....	1
Sleeping cars.....	5
Total cars.....	25

The same remarks as to reductions and increases of cars apply as in the case of the battery on a peace footing, except that five tourist sleepers are sufficient to accommodate the personnel with but little crowding.

1752. When battery trains must be divided into two sections, the first section contains the forage car, all the stock cars, and one sleeping car. The second section contains the remaining cars.

The first section should be under the command of one of the lieutenants, who should have with him the stable sergeant, the stable orderly, a horseshoer, one of the mechanics, and the number of other men that can be accommodated.

1753. When a battalion headquarters accompanies a battery, one additional tourist car and one additional stock car must be provided. If it is possible to provide separate cars for privately owned animals, a second additional stock car should be provided. The reel and cart will require an additional flat car only when the number of flat cars provided for the battery is reduced on account of extra long cars being available.

1754. If field wagons are to accompany a battery, additional flat cars at the rate of one for three wagons are provided.

1755. When one battalion headquarters and 9 of the wagons of the supply company are to move on the last train, the cars required are:

Flat cars.....	5
Box car for stores, harness, etc.....	1
Box car for forage.....	1
Stock cars.....	4
Baggage car, or box car with end doors.....	1
Tourist kitchen car.....	1
Sleeping car.....	1
Total cars.....	14

If possible, an additional stock or box car should be provided for privately owned animals.

1756. Horse Artillery organizations require the same number of cars as corresponding organizations of Light Artillery, with the exception of stock cars for the animals of the batteries. A horse battery on a peace footing requires 9, on a war footing 14 stock cars.

1757. When movements of large bodies of troops are involved, ordinary coaches or box cars may frequently have to be substituted for sleeping cars.

For movements of a few hours in the theater of operations, the personnel may have to ride on the flat cars. As in such cases the equipment is limited, the harness and stores may be carried in the flat cars with the carriages.

1758. In preparation for the journey all personal equipment and other property needed en route are kept separate from that not needed.

All the mechanics are provided with the heaviest hammers available. These hammers, with a supply of nails, are taken in the cars by the mechanics.

The blanket roll of each man is tagged and the rolls of each squad are tied into a bundle. These bundles, together with the officers' baggage, are carried in the baggage car.

Rations and kitchen equipment which will be needed during the journey or immediately upon arrival are placed under the charge of one of the cooks who sees that they are loaded in the baggage car, so as to be immediately accessible.

If the horses will probably be unloaded during the journey, each chief of section collects the feed bags belonging to his section and turns them over to the stable sergeant, who makes a memorandum thereof. The grain bags are retained by the men, who pack them with their saddles. The stable sergeant

sees that the feed bags, necessary grain measures, a few bandages and disinfectants, and stable tools are placed in the center of the forage car, so as to be readily accessible.

The men take their slickers or overcoats, canteens, and haversacks or saddle bags with them in the cars. Such arrangements are made as will avoid the necessity for carrying these articles while at work and insure their being properly guarded and available at the proper time.

1759. So far as practicable all stores, forage, etc., should be at the loading places before the train arrives (**1748**). Similarly, each battery complete with all its matériel, animals, and personnel, except those men needed as guards over stores, should arrive, so that the horses may be unharnessed and harness and carriages placed convenient to the loading places before its train is spotted. It is desirable that the detail of such guards as are necessary before the arrival of the battery should be made from the cannoneers.

1760. As soon as the battery has been unhitched the teams should be taken to the vicinity of the place at which the harness is to be loaded and there unharnessed. Each two pairs are held by a cannoneer designated by the chief of section.

The remaining cannoneers assist the drivers in unharnessing and securing the harness.

When harness sacks are available the harness of each pair is packed in its sack, plainly marked (**409**). The horse equipments of officers and individually mounted men are placed in sacks or, if sacks are not available, wrapped in saddle blankets, plainly tagged. The horse equipments of officers are placed in the baggage car or, if a separate car is provided, in the car with their mounts. The horse equipments of individually mounted men are placed in the car with the harness.

1761. If harness sacks are not available, grain sacks may be used (409), or a paulin may be used to wrap all the harness pertaining to each carriage. The following method is convenient:

In the description north, south, east, and west refer to the sides of the paulin, as it lies on the ground, and are used merely for convenience, any particular side being designated as north.

Spread paulin on the ground, marks down. Place near swing collar in center of paulin, bearing surfaces up, top north, near wheel and lead collars on right and left of it, bearing surfaces up, tops south. Place saddle blanket of each horse on his collar, folded as when placed on harness peg. Place off collars on blankets, bearing surfaces up, tops in a direction opposite to those of near collars. Place blankets on collars. Place near saddles on blankets, north and south, attachments folded across seats. Place off saddles upside down across near saddles, attachments underneath. Lay bridles between bars of off saddles. Fold near and swing traces and lay them on the pile, lengthwise. Place the neck yoke on the ends of the off blankets on one side of the pile. Fold wheel traces once and place on the other side of the pile.

Fold east and west sides of paulin over ends of pile, then north and south sides. Pass a picket rope around center of bundle, turn it once on itself, then take a turn around each end of the bundle with the free ends; cross these ends over ends of bundle, roll the bundle over, pass the ends of the rope along the other side of the bundle, taking a turn around the binding parts of the rope in passing, and engage the hook in the ring. Or, lay the picket rope on the ground, its center forming a U, the sides of which are about 2 feet apart. Spread the paulin over this and proceed as before. After the bundle is folded, the binding is somewhat simpler than in the

first case, but the bundle will be secured by only two turns instead of three and there will be an excess of rope. Tying a knot in such heavy rope is difficult.

The harness having been secured in bundles the cannoneers place them convenient to the loading place. In carrying the bundle care must be taken to hold them clear of the ground.

1762. The drivers take the horses to a designated place and secure them. If the stables or permanent picket lines are available they should be secured there and left under the charge of two drivers detailed as guards. Otherwise the horses of each section should be formed in a circle, the halter tie rope of each horse being securely tied to the halter of the horse next to him. In this case each chief of section details a driver to remain with the horses of his section as guard. In either case the horses are given a feed of hay, which should have been withheld from them for some hours before. Whenever practicable they should be watered about one hour before they are loaded.

1763. The horses having been unhitched and secured, the battery falls in, each man carrying his haversack or saddle bags, canteen, and slicker. These articles are deposited on the ground and a guard placed over them. The necessary details are made and the loading is started as soon as the cars have been inspected and turned over to the organization.

1764. Each train commander should detail an officer to accompany the quartermaster in the latter's inspection of the cars, made after the train is made up and before it is turned over to the troops for loading.

Passenger cars must be clean, fully supplied with water and ice, and sufficiently lighted and heated. Common defects are lack of water, ice, and illumination.

Stock cars must be inspected with special care to see that they are in good order throughout. Common defects are loose boards, rotten flooring, broken fixtures, protruding nails, and filthy condition. These are sources of danger and discomfort to the animals and of loss to the Government. Unsuitable cars should be rejected. In time of peace the commanding officer should not hesitate to suspend the movement until proper cars have been provided. In time of war it is usually necessary to be content with what can be obtained. Such repairs as are practicable should be made, and a report forwarded setting forth the conditions.

Baggage, box, and flat cars are usually in serviceable condition, but should nevertheless be thoroughly inspected.

1765. As soon as the cars have been accepted they are prepared for loading. The officer detailed to load the horses, accompanied by the stable sergeant and one or more of the mechanics, makes a detailed inspection of the stock cars. All projecting nail points are bent and splinters are removed. The breast bars on the doorways opposite the loading platform are examined, put in place, and the doors themselves securely fastened. Such repairs as may be necessary are made with the material available. The cars should be clean and the floors covered with at least 2½ inches of sand or sawdust. In permanent garrisons material for this purpose should be kept on hand.

The brake handles of the flat cars should be removed so that the carriages may be run from one car to another.

1766. Ordinarily a section can be usefully employed in loading a box or baggage car. A noncommissioned officer and about six men should be inside the car to stow the property. The remaining men pass in the packages.

In loading such cars care is taken to place the heaviest articles and those least needed at the bottom. Harness should

not be placed in piles deeper than two packages. Individual horse equipments and the bundles of blanket rolls may be stored on top of the harness.

1767. The carriages of a battery on a war footing are conveniently loaded in the following order: On the first car, the first section and one carriage of the fifth; on the second car, the second section and one carriage of the fifth; on the third car, the third section and one carriage of the sixth; on the fourth car, the fourth section and one carriage of the sixth; on the fifth car, the seventh section and the battery wagon and forge; on the sixth car, the eighth section and the store wagon.

In preparing to load, the carriages should be disposed conveniently for following the above sequence.

1768. Ordinarily no attempt is made to load more than one vehicle car at a time. It will be convenient to run the last limbers at least from an empty car to the one being loaded. Frequently the length of the loading platform will be such that several of the cars must be reached by running the carriages across other cars.

1769. As a rule two sections may be advantageously used in loading the carriages. The two driver squads bring the carriages in proper sequence to the loading platform convenient to the cars. One gun squad runs the carriages from the platform to the car being loaded; the remaining gun squad places the carriages in the proper position. If the platform is small and its approaches are difficult, additional men must assist the two driver squads.

1770. To load the first car when the carriages are run across other cars, proceed as follows:

The drivers run the carriages to the edge of the platform at a convenient car in the following order: First caisson, fifth section; caisson, first section; gun; limber, first caisson, fifth

section; caisson limber, first section; gun limber. Each of these is placed with its trail or pole pointing squarely across the car on which it is first to be placed. The gun squad designated to run the carriages to the car being loaded takes the carriages as they are placed by the drivers. Each caisson and the gun is successively drawn onto the car and its trail turned away from the direction in which it is thereafter to be run. Each is then pushed to the car being loaded, where it is dropped. The pole of each limber is turned in the direction in which it is to be run. Each limber is pulled to the car next the one being loaded. The gun squad designated to place the carriages on the car being loaded takes them as they are delivered and places them in position. The first caisson delivered is placed with the trail pointing toward the middle of the car, the wheels resting about 3 feet from the front end of the car. The next caisson is placed in a similar position, tires squarely against those of the first. The gun carriage is placed with its trail in the same direction as those of the caissons, the wheels so placed that no part of the gun or carriage touches the caisson. The limbers are put on in the order in which they are delivered, the poles pointing in a direction opposite to the trails. The pole of the first limber to be loaded is placed under the right trail seat of the gun, the wheels so that no part of the limber will touch the gun or carriage. Each of the other limbers is placed tire to tire with the limber next before it.

Care is taken that all the wheels are in line so that full-length timbers may be used in chocking the wheels against lateral movements.

The other cars are loaded in a similar manner, the store wagon or the battery wagon being placed as prescribed for a gun carriage. In loading the last car it may be necessary, when short cars are furnished, to take out the pole of the last limber.

The pole should be replaced as soon as the limber is in place.
(*C. D. and S. R. F. A. No. 1.*)

1771. The vehicles are secured with 2 by 4 inch timbers as follows:

Pieces nailed to the floor of the car on both sides of each wheel prevent transverse motion. These should be as long as practicable.

Pieces in front and rear of each wheel prevent longitudinal motion. These should be 7 feet long and are placed on and nailed to the pieces which lie alongside the wheels.

Pieces placed over the lowest part of the felloes and secured to the timbers which lie alongside the wheels prevent vertical motion. These should be 7 feet long. Small blocks nailed to the side timbers fore and aft of these crosspieces assist in securing them; 7-inch spikes should be used for this purpose.

The limber poles and the caisson trails may be secured by nailing blocks on both sides of each and one across the top near the end. The trail of each piece should be secured by nailing a block on each side of it, one in prolongation of its axis and one across the top near the end. All of these blocks should be 2 feet long and of 2 by 4 inch timber. When time is of importance the blocking of the poles and trails may be omitted without great danger. A spare piece of 2 by 4 inch timber should be secured to each car so that material for repairs may be available en route.

1772. The necessary timber and nails are furnished by the quartermaster. The most economical length of timber is 14 or 16 feet.

Whenever possible the proper lengths for crosspieces, blocks, etc., should be cut before the time for loading.

The material necessary for each battery is as follows:

One thousand eight hundred linear feet of 2 by 4 inch timber.

Seventy-five pounds 20-penny (4-inch) nails.

Ten pounds 7-inch nails.

For each three field wagons or reel carts 250 feet of timber and 10 pounds of nails should be allowed.

1773. As each flat car is loaded the mechanics nail the securing timbers in place. A gun squad should be detailed to bring the timbers and put them in position for nailing.

In the field, when sufficient lumber can not be obtained, chocks must be improvised from all available material. In such cases additional security is obtained by lashing together the wheels that are placed tire to tire.

1774. When ample time is available it may be desirable to remove such articles as paulins, lanterns, etc., from the carriages and carry them properly packed in a box car with other stores.

1775. The horses should not be loaded until the loading of all carriages and stores has been completed. Whenever possible the loading pens and chutes to be found at railroad stations should be used. In any case especial care must be taken that the horses have secure footing in passing into the car, and that side rails are provided to prevent their stepping between the car and the platform.

For each car being loaded four selected noncommissioned officers, a mechanic, and a gun squad should be detailed. Two of the noncommissioned officers work inside the car. The remaining noncommissioned officers work at the door of the car. Two of the members of the gun squad collect the halter tie ropes and see that they are turned over to the stable sergeant at the forage car. The remaining cannoneers assist the noncommissioned officers at the doors. When chutes are available all these men except the noncommissioned officers should remain outside the runways until they are needed. When pens and chutes are available the horses are penned by carload lots. A

noncommissioned officer and a driver squad are assigned to work in each loading pen. The remaining drivers bring the horses from the holding pens and place a new carload lot in the loading pen as soon as the preceding lot has been loaded. As the horses arrive the drivers in the loading pen remove the halter tie ropes and pass them to the cannoneers detailed to collect them. The gate to the runway is kept closed until the gangplank is in place, the side gates closed against the gangway, and the noncommissioned officers in place. Everything being in order, the gate is opened and one of the drivers leads a docile horse up the runway. The remaining drivers cause the horses to follow as closely as possible. This is accomplished without shouting or otherwise exciting the animals. Horses that hold back are slapped or gently struck across the rump with a tie rope. The noncommissioned officers inside the car place themselves near the door and keep the horses quiet by speaking to them. When the first horse arrives one of the noncommissioned officers takes him from the driver and leads him to one end of the car. After this the noncommissioned officers confine themselves to keeping the horses quiet and preventing them from leaving the car. Trained horses are thus allowed to pack themselves in the car. It is desirable that as many horses as practicable be placed in each car not provided with separate stalls.

With horses not trained in loading each noncommissioned officer may be assisted in the car by two men whose duty it is to hold the last horse received in place across the car.

The car having been filled, the noncommissioned officers inside the car first put up the breast bar and then leave the car. The gangplank is swung back, the side gates slipped back, and the car door closed. The mechanic fastens the door securely.

1776. When loading pens are not available and the horses must be loaded from a platform similar methods are used except

that all the horses are led by drivers into the car. The halter tie ropes are taken off after entering the car and turned over to the cannoneers collecting them as the drivers pass out. In leaving the car the drivers must be careful to avoid interfering with horses just entering.

1777. When permanent platforms are not available, platforms or ramps must be improvised.

For loading the carriages such platforms or ramps are preferably placed at the end of the cars. For animals the ramp should be well supported, have strong sides, and the bottom provided with cleats to give a secure footing. By taking advantage of shallow cuts and using baled hay, platforms may be readily improvised.

Much time and labor may be saved by carrying material for ramps ready prepared on the cars with the carriages.

1778. It is not necessary to wait for an engine each time cars must be spotted during loading or unloading. By uncoupling the cars, and distributing 20 or more men along the sides of those to be moved, two or more cars may readily be shifted. Care must be taken to have men ready to handle the brakes and to give signals in such a way as will cause all the men to work together.

1779. The animals having been loaded, the men fall in at the place where their equipments were left, secure them, and are marched to the coaches. The assignment of men to particular coaches should have been made beforehand so that the men may enter without delay.

So far as practicable sections are kept together. In each car the senior noncommissioned officer occupies a seat next the door at one end of the car and the next senior, except in the officers' car, a seat next the other door. These noncommissioned officers

preserve order and see that no one leaves the car without authority.

The cooks are in the kitchen car or in the car next to the baggage car used as a kitchen. The first sergeant, stable sergeant, supply sergeant, battery clerk, and mechanics are in the car with the officers.

Before entering the train the battery commander cautions the men not to leave the cars without specific orders, that complaints are to be made to him and not to the train crew, and gives such other instructions as may be necessary.

The sleeping-car conductor, or the porters, and the train conductor should be informed as to the orders relative to the introduction of unauthorized articles on the train and requested to impart this information to their subordinates.

1780. The train conductor should be requested to notify the battery commander immediately before any halt of 10 minutes or longer is to occur. During such stops an officer, accompanied by the supply and stable sergeants, the chief mechanic and one or more mechanics inspects the stock and flat cars and makes any repairs which may be necessary and practicable.

When the duration of the stop is considerable sentinels should be posted over the flat cars, unless they have a permanent guard.

1781. The animals should be unloaded once each 24 hours for exercise, feeding, and watering.

When the journey is to exceed 24 hours suitable arrangements should be made with the railroad authorities for the stop for feeding. It is desirable that the place for unloading should be selected several hours beforehand, so that proper notice may be given to the station agent and other railroad officials. In order to avoid reloading the animals at night a station should be selected that will be reached at about noon.

1782. The necessary requirements for a suitable feeding station are water and a platform or, preferably, chute for taking the animals out of the cars.

Ample stock pens, dry footing facilities for renewing the bedding in the cars, etc., are also desirable.

1783. Before reaching the feeding station the senior non-commissioned officer in each car details a cannoneer to remain in the car as a guard, causes the drivers to get out their grooming kits and cautions the men that their remaining equipment, except pistols, is to be left in the car.

Upon reaching the feeding station the men, except the mess sergeant, the cooks and guards, are notified to leave the cars and fall in at a designated place. Rolls having been called the drivers are formed separately from the cannoneers.

1784. Two gun squads are detailed to assist the stable sergeant in preparing the forage. These men are at once marched to the forage car. The stable sergeant, upon reaching the forage car, gives the halter tie ropes to one of the gunners who, assisted by a cannoneer, takes them to the stock cars and distributes them as they are needed. These men are responsible for collecting the tie ropes and turning them over to the stable sergeant when the horses are reloaded.

The stable sergeant causes the remaining men of his detail to put one feed of oats in each feed bag and to distribute one feed of hay at the feeding places.

The feed bags are not taken to the feeding places until the animals have been watered when all the cannoneers assist in this distribution. No attempt is made to give the horses their own feed bags.

1785. The supply sergeant, the chief mechanic, and all the mechanics not engaged in unloading the animals proceed, as soon as the rolls have been called, to the flat cars where they

make such repairs as may be necessary. Having completed these repairs the mechanics begin on the stock cars as soon as the latter have been unloaded.

As soon as an officer is available, one is detailed to inspect all this work, to cause any additional repairs that may be necessary to be made, and to superintend the resanding of the cars (1793).

1786. The drivers, the remaining gun squads, and the necessary mechanics are marched to the unloading place. Four selected noncommissioned officers, a gun squad and one mechanic are detailed for each place where a car is to be unloaded. These men remain at the same chute or platform until all of the cars there have been emptied. Before any car is unloaded sufficient drivers to provide one for each two horses are sent to join the above detail. Each of these drivers secures two halter tie ropes from the men distributing them. The remaining drivers and cannoneers are held in ranks until they are needed.

An officer should be in charge of the unloading of each car.

1787. Two of the noncommissioned officers of the above detail are assigned to work inside the car, the others working outside at the door. The cannoneers assist the latter noncommissioned officers and also assist the drivers in catching up the horses. The mechanic removes the fastenings and assists in opening the door.

The principal difficulty in unloading is in preventing the horses from leaving the car before the gangway, gates, or side rails, etc., are in place and in avoiding overcrowding in the doorway.

1788. As soon as the car is in place the door is opened enough to permit the noncommissioned officers who work inside to enter. These men at once enter, leaving the breast bar in place, and quiet the horses nearest the door by speaking to and caressing them. Everything being in readiness the door

is completely opened and the gangway, gates, etc., put in position as quickly as possible.

If a loading pen is available the drivers and cannoneers assigned to the car go into the pen to catch the horses up after they enter it. If no pen is available the drivers and cannoneers line themselves up on either side of the door, each one taking an animal in turn as he leaves the doorway. All men being in their places the noncommissioned officers inside the car remove the breast bar, and every endeavor is made to make the horses leave the car quietly and in single file.

1789. The cannoneers assist the drivers in catching up the horses. As soon as all the animals of the first lot have been caught up the pairs are formed in column and the drivers lead the horses around at a slow walk. A noncommissioned officer should be designated to lead the column of this first lot. As each succeeding car is unloaded and the horses caught up, the drivers join the rear of the column.

1790. If ample feeding lots are available a separate lot should be assigned each separate car. In any case no attempt is made to separate the horses by sections, but effort is made to keep together the horses that have been in the same car and to reload them together. Drivers remain with the pairs which they catch up and do not attempt to find their own horses unless the latter are with the same carload to which the driver is assigned. In this case a driver may be allowed to take his own horses after they are tied up for grooming and feeding.

1791. The object of walking the horses and of the subsequent grooming is to remove the stiffness and swelling of the legs induced by the long standing in the cars. For this reason the exercise of the horses should be continued for 10 or 15 minutes after the unloading of the last car has been completed.

1792. Hay having been distributed and the exercising completed, the horses are properly secured and then groomed while they are eating hay. During the grooming particular attention is paid to cleaning and hand rubbing the legs thoroughly. All kicks, cuts, and abrasions are reported to the stable sergeant, who visits all the horses at this time.

1793. During the grooming the cannoneers proceed to the stock cars and renew the sanding if material is available. Tools for this purpose may frequently be had from the railroad or stockyard authorities or they may be taken from the carriages. Sometimes it may be necessary to detail a number of cannoneers to draw water for the animals.

1794. The grooming is continued until the animals must be watered, which should be in time to allow them to eat their grain before it is necessary to begin reloading.

At the proper time the officer in charge of renewing the sand causes the cannoneers to take the filled feed bags and to distribute them after all the horses have been watered. He then details a gun squad to collect the feed bags and turn them over to the stable sergeant at the forage car after they have been removed from the horses.

1795. At least two hours should be allowed for unloading, feeding, and reloading.

In all loading and unloading particular care must be exercised to avoid any shouting or excitement on the part of the men; these are the principal causes of excitement on the part of the horses, which, in turn, is the source of most difficulties in handling the animals.

1796. Upon arrival at the detraining station complete and early information as to the facilities for unloading and other conditions is essential to the orderly planning and conduct of

the detraining. For this purpose each train should be met as it arrives by an officer or officers from preceding organizations.

1797. The detraining should ordinarily be so conducted as to release the cars as rapidly as possible and thus avoid congestion in the detraining station. Following this principle, the men take all of their equipment with them upon leaving the coaches; the stock cars are unloaded first, the flat cars next, and finally the baggage cars and the box cars.

1798. Upon arrival the noncommissioned officers cause the men to take their equipments, but no one leaves the cars except the officers and the first sergeant until ordered to do so. The necessary plan for unloading having been made, the men are ordered to leave the cars and fall in at a designated place. Rolls having been called, the mess sergeant and the cooks proceed directly to the baggage car containing the kitchen equipment and the rations. The remainder of the battery is marched to a suitable place where the men may leave their equipment. The men having deposited their equipment, a guard is placed, the necessary details are made, and the work of unloading begun.

1799. Whenever practicable, arrangements are made at once for unloading the kitchen equipment and necessary rations for the first meal and for transporting them to a suitable place. Such cannoneers as are necessary are detailed to assist the mess sergeant and cooks in this work. The horses are unloaded as heretofore described, but are arranged by sections as they are unloaded and are secured at once, care being exercised that they are not tied to movable or flimsy structures. The feed bags are not filled but hay is fed at once. Two or more cannoneers are set to work to sort the feed bags out by sections, and later, when the horses are being harnessed, to turn them over to the chiefs of section.

During the unloading of the horses the supply sergeant, the mechanics not assisting at the stock cars, and one gun squad proceed to the flat cars and begin the removal of the chocks preparatory to unloading. As the timbers are removed they are taken to a suitable place and one man is left with them as guard until they are finally disposed of.

1800. The horses having been unloaded, secured, and given a feed of hay, work on unloading the carriages is begun. Usually a part of the men may be usefully employed in unloading the baggage and box cars simultaneously with the unloading of the carriages.

1801. As the carriages are unloaded they are run to a suitable place and arranged in proper order in park or column convenient for hitching in. A guard is posted over the park as soon as the first carriage is placed.

1802. In unloading the harness it is arranged by sections so as to give ample room for harnessing.

1803. Ordinarily the battery should harness, hitch in, and clear the vicinity as soon as the horses, carriages, and harness have been unloaded. When the box cars have not been completely unloaded all cannoneers not needed to hold horses during the harnessing may be left at work unloading.

1804. While the foregoing methods of loading and unloading outline the principles which should be followed, the details of the plan adopted must be varied to conform to the conditions of each particular case. For example, the facilities for watering may be so limited that it will be necessary to water throughout the stop; or the period of travel may have been so great or the temperature so high that, to prevent suffering, watering should commence immediately after unloading.

The first essential is a definite plan, conformable to existing conditions and its methodical execution without excitement or undue haste.

SECTION II.—BY WATER.

1805. At sea, transportation of troops is effected by the Army Transport Service.

The necessary preliminaries before embarking, the routine details on board transports, and methods of disembarking are prescribed in the Army Transport Service Regulations, a copy of which should be secured by the commander of each organization designated for over-sea service.

1806. For over-sea transportation Artillery carriages should generally be knocked down; wheels removed and guns dismounted. Fuse setters and all implements, equipments, and wheel fastenings should be removed from the carriages and boxed. Harness and horse equipments, except such as are needed for use during the trip, will be boxed and marked to show the section to which they belong. For expeditions into the theater of operations it may be desirable not to dismount the guns or remove the wheels.

In time of peace, and when conditions permit in time of war, the ammunition chests will be emptied and all loose ammunition turned in, Artillery ammunition being embarked in original packages only.

The men retain in their possession their personal equipments.

Battery wagons, store wagons, reel carts, and signal chests should be fully equipped before embarking and should be stored where they will be accessible. For expeditions into the theater of operations it is obligatory that all of the personnel, matériel, and ammunition of a battery be carried on the same vessel.

1807. Horses are led aboard if docking facilities permit, otherwise they are lightered to the transport and hoisted aboard, if necessary, by means of slings or other appliances, with which the transport should be provided.

Horses should not be watered or fed for several hours before embarkation.

If it is necessary to disembark at a point where there are no wharves, suitable boats or lighters must be provided by the transport service.

In calm water horses may be lowered into the water or driven overboard from low ports and required to swim ashore. In such case the first horses overboard may be led from small boats.

1808. It is the duty of the transport service to provide forage for animals while on board and for proper arrangements for stabling them.

Special methods for the care and handling of animals on shipboard are prescribed in the Army Transport Service Regulations.

CHAPTER XIII.—FIELD AND SURPLUS KITS.

1809. The field kit consists of the arms, personal and horse equipments and clothing, additional to that worn on the person, required by and prescribed for the soldier in the field.

The articles comprising the kit vary with the duties of the men and are furnished by the Ordnance Department, the Quartermaster Corps, and the Medical Department.

1810. The field kit for individually mounted men consists of and is carried as shown below.

Ordnance Property.

(A) PERSONAL EQUIPMENT.

Articles.	Where carried.
1 can, bacon-----	Near saddle pocket.
1 canteen-----	Near canteen ring.
1 canteen cover-----	On canteen.
1 cup	
1 fork	
1 knife	
1 spoon	
1 meat can	
1 pistol, belt, holster, magazine pockets, 2 extra magazines, 21 cartridges-----	On person, belt outside all clothing, pistol on right hip, first-aid packet on left of and toward front of belt, magazine pocket in front of first-aid packet.
1 pouch for first-aid packet-----	
1 spurs, pair-----	On person, buckles outside.
1 spur straps, pair-----	

(B) HORSE EQUIPMENT.

1 bridle-----	On horse.
1 halter headstall-----	On horse.
1 halter tie rope-----	On halter, free end secured in near pommel ring.
1 link-----	On bridle, free end snapped up.
1 saddle blanket-----	On horse.
1 saddle-----	On horse.
1 saddlebags, pair-----	On saddle, the saddlebag straps passed through the cincha rings and drawn tight before fastening.
1 surcingle-----	Over saddle, buckled on near side.
1 currycomb	
1 horse brush	
1 feed bag-----	On saddle.
1 grain bag-----	In feed bag.

Quartermaster Property.

(C) EQUIPMENT.

- 1 identification tag-----Slung around neck by tape.
 5 pins, tent, shelter }-----In blanket roll.
 1 pole, tent, shelter }
 1 tent, shelter, half, mounted-----Around and forming part of blanket roll.

(D) CLOTHING COMPONENT.

- 1 blanket-----In blanket roll.
 1 slicker-----Rolled and strapped to pommel of saddle.
 1 towel-----Off saddle pocket, outside canvas lining.
 1 comb }
 1 soap, cake }-----Wrapped in towel.
 1 toothbrush }
 1 drawers, pair }
 2 stockings, pairs }-----In blanket roll.
 1 undershirt }

(E) RATIONS.

- 2 reserve rations, each consisting of—
 12 ounces bacon-----In bacon can.
 16 ounces hard bread-----Divided between saddle pockets.
 1.12 ounces coffee, R. & G-----In coffee bag of saddlebags, in near pocket.
 2.4 ounces sugar-----In sugar bag of saddlebags, in near pocket.
 0.16 ounce salt-----In salt bag of saddlebags, in near pocket.

(F) FORAGE.

- 1 feed, 4 pounds of grain-----In grain bag.

(G) MEDICAL PROPERTY.

- 1 first-aid packet-----In pouch on belt.

1811. The sweater and the overcoat form part of the equipment to be carried with the men in the field only when climatic conditions require them. When they are not ordered carried they are made up in bundles, secured and marked so that they may be forwarded whenever necessary.

1812. When the sweater is carried and is not worn on the person it is placed in the blanket roll. When the overcoat is carried and is not worn it is rolled and strapped on the pommel of the saddle.

1813. To roll the overcoat or slicker.—Spread the overcoat on the ground, inside down, skirt buttoned throughout, sleeves parallel to the middle seam, collar turned over on the shoulders.

Turn the tails of the coat under about 9 inches, the folded edge perpendicular to the back seam. Fold over the sides to form a rectangle not more than 34 inches across, according to the size of the coat. Roll tightly from the collar with the hands and knees, and bring over the whole roll that part of the skirt which was turned under, thus binding the roll.

The slicker is rolled in a similar manner.

1814. To make the blanket roll for mounted men.—Spread the shelter half (model 1904) on the ground, roll straps underneath, and fold over the triangular part on the rectangular part. Turn under the roll strap edge of the shelter half so that the width of the fold will be 8 inches. Fold the blanket once across the longer edges and lay the blanket on the shelter half, folded edge within 1 inch of the roll strap edge of the shelter half. Fold the sides of the blanket and of the shelter half inward, width of folds about 11 inches. The shelter tent pole and pins are now laid on the blanket at the edge farthest from the roll strap edge, pole on one side of the center line, pins on the other, so as to allow the roll when completed to bend at the center. Place the

underclothing on the blanket. If the sweater is to go in the roll, spread it smoothly over the blanket.

Roll tightly toward the roll strap edge, using hands and knees, and bring over the entire roll the part of the shelter half which was turned under, thus binding the roll. Buckle the two available roll straps about the roll, passing them around twice. The roll thus formed should be about 44 inches long.

1815. To pack the feed bag for individually mounted men.—The grain is placed in the grain sack and equally divided between the two halves. The elongated grain sack is then placed inside the feed bag and the whole lashed tightly to the blanket roll by the web straps at each end of the feed bag, so that the open part of the feed bag is closed against the blanket roll. If empty, the feed bag, with grain sack inclosed and all web straps buried in the bag, is lashed to the blanket roll by the coat straps.

To pack the blanket roll with the attached feed bag, three coat straps are used, one to fasten the middle of the roll to the middle of the cantle of the saddle, and one at each end to fasten the end of the roll to the saddlebag strap ring. The blanket roll is placed on the cantle so that the feed bag will be uppermost. The coat straps are passed twice around the roll and buckled.

1816. The equipment of each driver is the same as for individually mounted men with the exception of horse equipment and grain.

The driver's horse equipment consists of 1 horse brush, 1 currycomb, 2 feed bags, 2 grain bags, and 2 surcingles. Each driver carries a feed of grain for each horse. Halters, saddlebags, saddle blankets, etc., are included in the harness.

1817. The driver's canteen is snapped in the near pommel ring of the off saddle. His saddlebags, blanket roll, feed bags, slicker, etc., are likewise packed on the off saddle. After attach-

ing his slicker the driver turns the top of the roll over the pommel down into the saddle so as to avoid any interference with the rein roller on the off saddle.

1818. To pack the driver's blanket roll and feed bags.—The grain is placed in the grain sacks and each sack placed in its feed bag. The two feed bags are tied securely together at their open ends, using the "nose and head" web straps, the two bags being tied as closely as possible to prevent the lower ends chafing against the traces. The two feed bags are then suspended across the seat of the saddle of the off horse and lashed in place by the 60-inch coat straps on each side, as follows:

Pass the coat strap under the rear quarter strap and take one turn around the nose bag, if necessary punching a "throat" into the bag near the lower end to prevent the coat strap slipping. The blanket roll being lashed to the center of the cantle, bring the free end of the roll forward so as to bind over the feed bag and take two turns around the end of the blanket roll with the coat strap. Then pass the free end of this strap over the straps thus in place and buckle tightly. Do the same on the other side.

If more than one feed is to be carried, place the grain for the first feed in the closed end of the feed bag and lash the feed bag tightly with the rawhide thong. Put the remainder of the grain in the grain sack, and place the grain sack in the feed bag; secure the two feed bags to the off saddle as above.

The surcingles are carried one on each horse, buckled over the saddle.

With the exceptions noted, all articles of the driver's equipment are packed and carried in a manner similar to that described for individually mounted men.

1819. In addition to the kits above prescribed, each corporal is provided with a housewife which he will carry in his haversack or off saddle pocket.

The members of the special details and of the headquarters company are provided with various equipment which they carry on their persons. The field glasses will be carried on the right side, the flag kit on the back, the strap in each case passing over the left shoulder.

An agent while on duty as such will wear on the right forearm a red brassard. Brassards are furnished by the Quartermaster Corps.

1820. The field kit for cannoneers and all men not mounted, including Nos. 8 trained as spare drivers, consists of and is carried as shown below:

Ordinance Property.

(A) PERSONAL EQUIPMENT.

Articles.	Where carried.
1 can, bacon	}-----In haversack.
1 can, condiment	
1 canteen-----	On right rear of pistol belt.
1 canteen cover-----	On canteen.
1 cup	}-----On canteen under cover.
1 fork	
1 knife	
1 spoon	
1 meat can	
Mess kit-----	
	In haversack.
	In haversack.
	In haversack.
	In haversack.
1 pistol, belt, holster, magazine pocket, 2 extra magazines, 21 cartridges.	}-----On person, belt outside all clothing on right hip, first-aid packet on left of and toward front of belt, magazine pocket in front of first-aid packet.
1 pouch for first-aid packet.	
1 haversack-----	On person.

Quartermaster Property.

(C) EQUIPMENT.

- 1 identification tag-----Slung around neck by tape.
5 pins, tent, shelter }-----In blanket roll.
1 pole, tent, shelter }
1 tent, shelter, half mounted-----Around and forming part of the
blanket roll.
1 blanket-----In blanket roll.
1 slicker-----Folded and placed between folds of
one of paulins of carriage on which
soldier rides.
1 towel-----In haversack.
1 comb
1 soap, cake }-----Wrapped in towel.
1 toothbrush }
1 drawers, pair }
2 stockings, pairs }-----In blanket roll.
1 undershirt }

(E) RATIONS.

- 2 reserve rations, each consisting of—
- | | | |
|-----------------------------|-------|-------------------------|
| 12 ounces bacon | ----- | In bacon can. |
| 16 ounces hard bread | ----- | In haversack. |
| 1.12 ounces coffee, R. & G. | } | ----- In condiment can. |
| 2.4 ounces sugar | | |
| 0.16 ounce salt | | |

(G) MEDICAL PROPERTY.

- 1 first-aid packet-----In pouch on belt.

1821. The remarks made with reference to the sweater and the overcoat in the case of mounted men (1811) apply to cannoneers except that when the overcoat is carried, and not worn by the cannoneer, it is folded and placed between the folds of a paulin on a carriage of the section to which the cannoneer is assigned.

1822. When the old model haversack and canteen are issued the personal equipment of men not mounted is increased by two canteen haversack straps. Such haversacks are slung from the right shoulder to the left side. The canteen is slung from the left shoulder to the right side, the strap passing over that of the haversack. Both ends of the haversack strap and the rear end of the canteen strap pass under the piston belt.

When the old model canteen and cup are issued the cup is carried in the near saddle pocket by mounted men and in the haversack by men not mounted.

1823. To make the blanket roll for men not mounted.—Lay the shelter half on the ground and fold over the triangular part.

Hold the blanket up by two corners, the shorter edges vertical; bring the two corners together, thus folding the blanket in the middle; take the folded corner between the thumb and forefinger of the right hand, thumb pointing to the left; slip the left hand down the folded edge two-thirds of its length and seize it with the thumb and second finger; raise the hands to the height of the shoulder, the blanket extending between them; bring the hands together, the double fold falling outward; pass the folded corner from the right hand into the left hand, between the thumb and forefinger; slip the second finger of the right hand between the folds, seize the double folded corner; turn the left (disengaged) corner in, and seize it with the thumb and forefinger of the right hand, the second finger of the right hand stretching and evening the folds. The blanket is now folded in six thicknesses.

Lay the folded blanket on the shelter half so that one of its shorter sides will be about 8 inches from the edge of the shelter half farthest from the triangular part. Place the underclothing on the blanket. If the sweater is to go in the roll fold it and

place it on the blanket with the folded edge of the sweater even with that of the folded edge of the blanket. Across the other short side of the blanket place the shelter tent pole and pins.

Fold over the sides and ends of the shelter half which lie on side of the blanket, causing the ropes and straps to be included within the folds.

Commencing at the end where the pole and pins are placed roll the pack, using the hands and knees to insure the roll being made as tight as possible. Just before the roll is completed open out slightly with the hands the pocket formed by the 8-inch fold of the shelter half, and then draw the pocket over the roll, thus binding it. Care should be taken to draw the canvas over the ends of the roll so as to prevent rain and dust from entering the inner portion of the roll. The roll thus formed should be about 22 inches long.

The roll is secured to the limber chest of the carriage to which the soldier is assigned, by means of the straps provided for that purpose. The rolls carried on any one limber chest are evenly disposed on either side of the door lock.

1824. It is frequently desirable, especially in a strong wind, for the men to work in pairs in making their rolls.

1825. The surplus kit contains articles of clothing necessary in camps of several weeks' duration and to permit the replacement of clothing worn out in active operations. For these purposes the surplus kits are forwarded to troops when serving in instruction, maneuver, mobilization, and concentration camps, or when in active service temporary suspensions of operation, or other conditions, permit the troops to refit. In certain cases in time of peace the surplus kits may, when transportation is available, accompany the troops on the march.

1826. The surplus kit of each man consists of—

breeches, pair.	2 stockings, pairs.
drawers, pair.	1 shoe laces, extra pair.
shirt, olive drab.	1 undershirt.
shoes, russet leather, pair.	

1827. The kit of each man will be packed as follows:

Stockings, rolled tightly, one pair in the toe of each shoe; shoes laced together, heels at opposite ends, soles outward, wrapped tightly in underwear, and bundle securely tied around the middle; the extra pair of shoe laces, each bundle tagged with the battery number of the owner.

The breeches and olive-drab shirt are not rolled (**1829**).

1828. Surplus kit bags at the rate of one to each eight men; major fraction thereof are issued to organizations by the Quartermaster Corps.

All bags will be uniformly marked in the center of the front cover flap. Those pertaining to a battery are marked with the battery stencil and with the designation of the squad to which the bag pertains; for example, the bag belonging to the drivers of the first section will be marked below the stencil, **FIRST EC.**, and below that, **DRIVERS**.

Bags pertaining to the headquarters company and to the supply company are marked with the headquarters company and the supply company stencil and the serial number of the bag.

1829. The shoes, underwear, etc., of each squad are packed in the surplus kit bag in two layers of four kits each; the breeches and olive-drab shirts are neatly folded and packed on the top and sides of the layers.

1830. In garrison, the surplus kit articles are not required to be kept habitually packed and stored, or kept apart from the rest of a soldier's belongings. The soldier should, however, have the clothing component of both the field and surplus kits.

Organization commanders will require the surplus kits to be prepared and packed from time to time as a matter of instruction.

CHAPTER XIV—CAMPING.

1881. The forms and dimensions of camps and the character and amount of tentage or other shelter used vary greatly with the conditions.

In permanent camp or when operations partake of the nature of a siege, every effort must be made to provide adequate shelter for both men and animals.

Animals constantly exposed to the sun in hot weather and to cold winds, rain, or snow in winter lose condition very rapidly.

1882. The general arrangement of semipermanent camps and the requirements which camp sites should fulfill are given in Field Service Regulations. Whenever practicable the width of the camp therein shown should be somewhat extended and provision should be made for lines on picket posts for the horses.

The picket line should be well drained by cutting ditches about 12 feet on either side of the line and throwing the earth to the center. Whenever practicable the ground should be covered with broken stone, sand, or cinders. Particular care must be taken to provide dry footing not only on the picket line but around the watering places in permanent or semipermanent camps.

1883. Suitable tents or other shelter must be provided for workshops for mechanics and for kitchens. Condemned canvas can be utilized for these purposes in camps of a duration too short to justify suitable buildings.

When the camp is reached by rail the timbers used in securing the carriages on the cars are, if carefully removed, very convenient for such purposes.

The Selection of Camp Sites in the Field.

1834. In campaign, tactical necessity may leave little choice in the selection of camp sites, but under any conditions the requirements of sanitation should be given every consideration consistent with the tactical situation.

1835. Great care should be exercised in selecting sites. In general the following principles govern:

The site should be convenient to an abundant supply of pure water.

Good roads should lead to the camp. Interior communication throughout the camp should be easy. A camp near a main road is undesirable on account of dust and noise.

Wood, grass, forage, and supplies should be at hand or easily obtainable.

The ground should accommodate the command without crowding and without compelling the troops of one unit to pass through the camp of another.

The site should be sufficiently high and rolling to drain off storm water readily, and, if the season be hot, to face the breeze. In cold weather it should preferably have a southern exposure, with woods to break the prevailing winds. In warm weather an eastern exposure, with the site moderately shaded by trees, is desirable.

The site should be dry. For this reason porous soil, covered with stout turf and underlaid by a sandy or gravelly subsoil, is best. A site on clay soil, or where the ground water approaches the surface, is damp and unhealthful.

Alluvial soils, marshy ground, and ground near the base of hills or near thick woods or dense vegetation are undesirable as camp sites on account of dampness. Ravines and depressions are likely to be unduly warm and to have insufficient or undesirable air currents.

Proximity to marshes or stagnant water is undesirable on account of the dampness and mosquitoes and the diseases which the latter transmit. The high banks of lakes or large streams often make desirable camp sites.

Dry beds of streams should be avoided; they are subject to sudden freshet.

1836. The occupation of old camp sites is dangerous, since these are often permeated by elements of disease which persist for considerable periods. Camp sites must be changed promptly when there is evidence of soil pollution or when epidemic disease threatens, but the need for frequent changes on this account may be a reflection on the sanitary administration of the camp.

A change of camp site is often desirable in order to secure a change of surroundings and to abandon areas which have become dusty and cut up.

1837. Under service conditions camp sites that will permit the encampment of regiments and brigades will often be unavailable and regularity must be sacrificed.

1838. In large commands the halt order should assign camp sites to the next smaller commands, and the commanders of the latter should locate their respective commands to the best advantage on the area assigned them.

1839. Each battery ordinarily parks in line. The shelter tents of the men are in two lines, with a distance of about 10 yards between lines, the front line being about 10 yards in rear of the line of caissons. The tents may also be pitched facing a flank (**1856**). (*C. D. and S. R. F. A. No. 1.*)

1840. Whenever practicable the intervals between sections in the park should not be reduced. A minimum of 40 yards by 200 yards is thus necessary for the shelter-tent camp and park. When the available ground is more restricted or when the

weather is good shelter tents need not be pitched, the men sheltering themselves under the paulins covering the carriages or harness.

Water Supply.

1841. Immediately on making camp a guard should be placed over the water supply. If the water be obtained from a stream, places should be designated, beginning upstream, (1) for drinking and cooking, (2) for watering animals, (3) for bathing and washing clothing.

If the stream be small, the water supply may be increased by building a dam. Small springs may be dug out and each lined with a gabion, or a barrel or box with both ends removed, or with stones, the space between the lining and the earth being filled with puddled clay. A rim of clay should be built to keep out surface drainage. The same method may be used near swamps, streams, or lakes to increase or clarify the water supply.

1842. Water that is not known to be pure should be boiled 20 minutes; it should then be cooled and aerated by being poured repeatedly from one clean container to another, or it may be purified by approved apparatus supplied for the purpose.

1843. Arrangements should be made for men to draw water from the authorized receptacles by means of a faucet. The dipping of water from the receptacles or the use of a common drinking cup should be prohibited.

1844. On the march, including camps, the daily requirements of water may be estimated at 6 gallons per man or 10 gallons per horse. In permanent or semipermanent camps the supply should be sufficient to provide from 25 to 30 gallons per man and 15 gallons per horse per day. This supply should be properly piped and delivered at convenient places in each organization camp.

Kitchen.

1845. Camp kettles are hung on irons or on a support consisting of a green pole lying in the crotches of two upright posts of the same character.

A narrow trench for the fire, about 1 foot deep under the pole, protects the fire from the wind and saves fuel. A still greater economy of fuel can be effected by digging a similar trench in the direction of the wind and slightly narrower than the diameter of the kettles. The kettles are then placed on the trench and the space over it and between the kettles filled in with stones, clay, etc., leaving the flue running beneath the kettles. The draft can be improved by building a chimney of stones, clay, etc., at the leeward end of the flue.

Four such trenches radiating from a common central chimney will give one flue for use whatever may be the direction of the wind.

A slight slope in the flue, from the chimney down, provides for drainage and improves the draft.

1846. The lack of portable ovens can be met by ovens constructed of stone and covered with earth to retain the heat. If no stone is available, an empty barrel, with one head out, is laid on its side and covered with wet clay to a depth of 6 or more inches, and then with a layer of dry earth equally thick. A flue is constructed with clay above the closed end of the barrel, which is then burned out with a hot fire. This leaves a baked clay covering for the oven.

A recess can be similarly constructed with boards or even brushwood, supported on a horizontal pole resting on upright posts, covered and burnt out as in the case of the barrel.

When clay banks are available, an oven may be excavated therein and used at once.

To bake in such ovens, first heat them, and then close flues and ends.

1847. Food must be protected from flies, dust, and sun. Facilities must be provided for cleaning and scalding the mess equipment of the men. Kitchens and the ground around them must be kept scrupulously clean.

1848. Solid refuse should be promptly burned, either in the kitchen fire or in an improvised crematory.

1849. In temporary camps, if the soil is porous, liquid refuse from the kitchens may be strained through sacking into seepage pits dug near the kitchen. Boards or poles, covered with brush or grass and a layer of earth may be used to prevent the access of flies. The strainer should also be protected from flies. Pits of this kind in clay soil will not operate successfully. All pits should be filled with earth when the camp is abandoned.

Disposal of Excreta.

1850. Immediately on arriving in camp sinks should be dug. This is a matter of fundamental sanitary importance, since the most serious epidemics of camp diseases are spread from human excreta.

One sink is usually provided for each battery and one for the officers of each battalion. Those for the men are invariably located on the side of camp opposite the kitchens. All sinks should be so placed that they can not pollute the water supply or camp site as a result of drainage or overflow. To insure this, their localities and their distance from camp may be varied.

1851. When camp is made for a single night, shallow trenches, 12 inches deep and 15 to 18 inches wide, which the men may straddle, will suffice.

In camps of longer duration, and when it is not possible to provide latrine boxes, as for permanent camps, deeper trenches

should be dug. These may be used as straddle trenches or a seat and back rest improvised from poles or other available material. They should be screened by brush, condemned canvas, or other material. When open trenches are used, special care must be taken to insure that all excreta is covered with earth, lime, or ashes as soon as it is deposited.

1852. In permanent or semipermanent camps special sanitary facilities for the disposal or disinfection of excreta will ordinarily be provided. When trenches are used in such camps they should be at least 6 feet deep and 12 feet long and not more than 2 feet wide. Seats are walled to the ground and provided with lids to keep flies from reaching the deposits; urinal troughs discharging into the trenches are provided. Each day the latrine boxes are thoroughly cleaned, outside by scrubbing and inside by applying when necessary a coat of crude oil or whitewash. The pit is burned out daily with approximately 1 gallon of crude oil and 15 pounds of straw. When filled to within 2 feet of the surface, such latrines are discarded, filled with earth, and their position marked.

In permanent camps urine tubs should be placed in the battery streets at nightfall; they are emptied after reveille. Their location should be plainly marked and thoroughly and frequently disinfected.

Daily Routine.

1853. In camps of some duration guard and other duties follow closely the custom in garrison.

The camp is policed daily after breakfast and all refuse burned. Tent walls are raised immediately after breakfast and the bedding and clothing aired daily, weather permitting.

1854. When troops bivouac for the night the necessity for extensive sanitary precautions is not great; however, shallow

sink trenches are dug to prevent general pollution of the vicinity. If the cooking be collective, shallow kitchen sinks should be dug. If the cooking be individual, the men should be required to build their fires on the leeward flank of the camp or bivouac.

Before marching the ground should be thoroughly policed, all refuse burned or buried, all trenches filled in, and fires extinguished.

Security.

1855. In campaign the general security of the camp is usually provided by outposts and guards from the other arms. The Artillery provides guards for its parks and picket lines and for such other places within its camps as may be necessary. The guard should ordinarily be sufficient to furnish for each picket line a double sentinel from the organization to which the line pertains. The guard is, when practicable, mounted by battalion or regiment, the necessary officers and noncommissioned officers being detailed by roster. The necessary sentinels for stores, etc., are also detailed by battalion or regimental roster. Except in permanent or semipermanent camps all members of guards are sent to join their organizations at reveille. If prisoners are to be guarded during the march they are either turned over to the organization commander or are marched with and guarded by the battery to which the officer of the day belongs.

Tent Pitching—Shelter Tents.

1856. When shelter tents are to be pitched the first sergeant, after the horses have been unharnessed, properly secured and cared for, and the guard having been sent to its post, gives the command: **In two lines** (or **In column facing to the right**

(left)) **form for shelter tents.** The men, carrying their blanket rolls, saddlebags, canteens, and haversacks, proceed to the rear of the rear carriage of their sections. Each chief of section causes his section to fall in in column of squads, the driver squad in front, with a distance of about 10 yards between the squads. The squads of each section face the park if the command be **In two lines.** All the squads face in the designated direction if the command be **In column facing to the right (left).** In either case 10 yards open space is left in rear of the rear line of carriages.

1857. Each chief of section arranges for pairing odd men in his squads as far as practicable. If, after this has been done, any man in the section, including the chief of section, remains unpaired the first sergeant is notified. Having arranged pairs between the men left over in the several sections the first sergeant reports the battery formed, and with the guidon, with whom the sergeant pitches, takes his place to the right of the leading squad of the first section. The first sergeant having reported, the officer in charge causes the battery to take intervals as prescribed in *The Squad*. The men of each squad take intervals, but no attempt is made to close the squads to the right or left. As each man faces to the front he places his blanket roll and other equipment on the ground.

1858. The officer aligns the men and commands: **Pitch tents.** The men open their blanket rolls and take out the shelter half, poles and pins; the front rank man places one pin in the ground at the point where his right heel, kept in position until this time, was planted. Each then spreads his shelter half, triangle to the rear, flat upon the ground the tent is to occupy, rear man's half on the right. The halves are then buttoned together. Each front man joins his pole, inserts the top in the eyes of the halves, and holds the pole upright beside the pin placed in the

ground; his rear rank man, using the pin in front, pins down the front corners of the tent on the line of pins, stretching the canvas taut; he then inserts a pin in the eye of the rope and drives the pin at such distance in front of the pole as to hold the rope taut. Both then go to the rear of the tent; the rear rank man adjusts the pole and the front rank man drives the pins. The rest of the pins are then driven by both men, the rear rank man working on the right.

As soon as the tent is pitched each man arranges the contents of the blanket roll in the tent and stands at attention in front of his own half on line with the front guy rope pin.

The guy ropes, to have a uniform slope when the shelter tents are pitched, should all be of the same length.

1859. The guard pitches tents at its post. The cooks' tents are usually pitched at the kitchen.

To Strike Shelter Tents.

1860. The men standing in front of their tents: **Strike tents.** Equipments are removed from the tents; the tents are lowered, rolls made up, equipments slung, and the men stand at attention in the places originally occupied after taking intervals.

To Pitch Heavy Tentage.

1861. The heavy tentage of batteries is usually pitched in two lines, the distance between the lines being about 50 feet for pyramidal tents. The office tent is pitched in the front line at the end next to the line of officers' tents. The first sergeant and the battery clerk are usually assigned to this tent. The tent in the rear line in rear of the office tent is assigned to the battery commander's detail, etc. The remaining tents are assigned two to each section. The chiefs of section and the driver squads occupy the front line, the gun squads the second line.

1862. To pitch all types of army tents, except shelter tents: Mark each line of tents by driving a wall pin at the spot to be occupied by the right (left) corner of each tent. For pyramidal tents the interval between adjacent pins should be about 30 feet, which will give a passage of 2 feet between tents. If the tripod is used, spread it on the ground where the center of the tent is to be. Spread the tent on the ground to be occupied, door to the front, and place the right (left) front wall loop over the pin. The door (or doors, if more than one) being fastened and held together at the bottom, the left (right) corner wall loop is carried to the left (right) as far as it will go and a wall pin driven through it, the pin being placed in the line with the right (left) corner pins already driven. At the same time the rear corner wall loops are pulled to the rear and outward so that the rear and side walls of the tent are stretched. Wall pins are then driven through these loops directly in rear of the corresponding front corner pins, making a rectangle. Unless the canvas be wet, a small amount of slack should be allowed before the corner pins are driven. According to the size of the tent, one or two men, crawling under the tent if necessary, fit each pole or ridge or upright into the ring or ridge-pole holes, and such accessories as hood, fly, and brace ropes are adjusted. If a tripod be used an additional man will go under the tent to adjust it. The tent, steadied by the remaining men, one at each corner guy rope, will then be raised. If the tent is of the ward or storage type, corner poles will now be placed at the four corners. The four corner guy ropes are then placed over the lower notches of the large pins driven in prolongation of the diagonals at such distance as to hold the walls and ends of the tent vertical and smooth when the guy ropes are drawn taut. A wall pin is then driven through each remaining wall loop and a large pin for each guy rope is driven in line with the

corner guy pins already driven. The guy ropes of the tent are placed over the lower notches, while the guy ropes of the fly are placed over the upper notches, and are then drawn taut. Brace ropes, when used, are then secured to stakes or pins suitably placed.

To Strike Heavy Tentage.

1863. Strike tents.—The men first remove all pins except those of the four corner guy ropes. The pins are neatly piled or placed in their receptacle.

One man holds each guy and when the ground is clear the tent is lowered, and folded or rolled and tied, the poles or tripod and poles fastened together, and the remaining pins collected.

To Fold Tents.

1864. Common, wall, hospital, and storage tents.—Spread the tent flat on the ground, folded at the ridge so that bottoms of side walls are even, ends of tent forming triangles to the right and left; fold the triangular ends of the tent in toward the middle, making it rectangular in shape; fold the top over about 9 inches; fold the tent in two by carrying the top fold over clear to the foot; fold again in two from the top to the foot; throw all guys on tent except the second from each end; fold the ends in so as to cover about two-thirds of the second widths of canvas; fold the left end over to meet the turned-in edge of the right end, then fold the right end over the top, completing the bundle; tie with the two exposed guys.

Pyramidal tent.—The tent is thrown toward the rear and the back wall and roof canvas pulled out smooth. This may be most easily accomplished by leaving the rear-corner wall pins in the ground with the wall loops attached, one man at each rear-

corner guy, and one holding the square iron in a perpendicular position and pulling the canvas to its limit away from the former front of the tent. This leaves the three remaining sides of the tent on top of the rear side, with the door side in the middle.

Now carry the right-front corner over and lay it on the left-rear corner. Pull all canvas smooth, throw guys toward square iron, and pull bottom edges even. Then take the right-front corner and return to the right, covering the right-rear corner. This folds the right side of the tent on itself, with the crease in the middle and under the front side of the tent.

Next carry the left-front corner to the right and back as described above; this when completed will leave the front and rear sides of the tent lying smooth and flat and the two side walls folded inward, each on itself.

Place the hood in the square iron which has been forced downward toward the bottom of the tent, and continue to fold around the square iron as a core, pressing all folds down flat and smooth and parallel with the bottom of the tent. If each fold is compactly made and the canvas kept smooth, the last fold will exactly cover the lower edge of the canvas. Lay all exposed guys along the folded canvas except the two on the center width, which should be pulled out and away from bottom edge to their extreme length for tying. Now, beginning at one end, fold toward the center on the first seam (that joining the first and second widths) and fold again toward the center so that the already folded canvas will come to within about 3 inches of the middle width. Then fold over to the opposite edge of middle width of canvas. Then begin folding from opposite end, folding the first width in half; then, making a second fold to come within about 4 or 5 inches of that al-

ready folded, turn this fold entirely over that already folded. Take the exposed guys and draw them taut across each other, turn bundle over on the under guy, cross guys on top of bundle, drawing tight. Turn bundle over on the crossed guys and tie lengthwise. .

When properly tied and pressed together this will make a package 11 by 23 by 34 inches, requiring about 8,853 cubic inches to store or pack.

Stencil the organization designation on the lower half of the middle width of canvas in the back wall.



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